

MILITARY REVIEW



COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

JANUARY 1954

VOLUME XXXIII

NUMBER 10



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CONTENTS

THE ETHICS OF WAR	3
<i>Colonel William S. Hutchinson, Jr., Chemical Corps</i>	
DIVISION PLANNING AT THE RIVER LINE	9
<i>Colonel H. F. Cameron, Jr., Corps of Engineers</i>	
MILITARY DELINQUENCY AND SERVICE MOTIVATION	21
<i>Captain William R. Perl, MSC</i>	
FIRE SUPPORT FOR AMPHIBIOUS OPERATIONS	28
<i>Lieutenant Colonel Charles L. McNeill, Armor</i>	
AIR WEATHER SERVICE	33
A PLAN FOR ARMY REORGANIZATION	39
<i>Mr. Karl R. Bendetsen</i>	
MILITARY NOTES AROUND THE WORLD	61
FOREIGN MILITARY DIGESTS	71
<i>The Kamikaze Attack Corps</i> 71	
<i>India's Wartime Effort</i> 80	
<i>Technique of Night Fighting</i> 85	
<i>Surprise—Its Present Value</i> 91	
<i>Camouflage of Middle East Airfields</i> 99	
BOOKS OF INTEREST TO THE MILITARY READER	108

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The printing of this publication has been approved by
the Director of the Bureau of the Budget 2 July 1953.

MILITARY REVIEW—Published monthly by the Command and General Staff College at Fort Leavenworth, Kansas, in the English, Spanish, and Portuguese languages. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rates: \$3.50 (United States currency) a year in the United States and other countries of the Western Hemisphere; \$4.50 a year in all other countries. Individual reprints, except for copyrighted material, are authorized, provided credit is given the "MILITARY REVIEW," Command and General Staff College, Fort Leavenworth, Kansas.

THE ETHICS OF WAR

Colonel William S. Hutchinson, Jr., *Chemical Corps*
Chemical Officer, X Corps

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN A WORLD grown wise in the ways of war, gas warfare still conjures up pictures of evil unique even among modern weapons. Thanks to the heritage of Western medieval chivalry—after more than three centuries of intermittent mortal combat throughout the world, since the American and other savages first taught itinerant western colonizers the military idiocy of the old "Knight's Code"—poisoning a man is still considered to be less chivalrous than knifing him. Both are held to be ethically inferior to shooting him. The rifle is a real man's weapon. Out of these traditional prejudices has grown a moral code which accepts slitting a man's throat, cutting him in half with machine-gun fire, blowing his head off, burning him so that the corpse no longer looks human, and vaporizing him in a few seconds, if he should happen to get close to an atomic explosion. Yet poisoning him is tabu—something no one will do until somebody else does it first.

There is no choice among the relative niceties of the various forms of killing. Prejudices spring from lack of information. The medieval knights knew little about poison. Americans today know little

of chemical warfare. There is no chivalrous form of murder. In the eyes of God, whatever sin attaches to poisoning a man, attaches likewise to shooting him.

Men fight today for the same reasons they always have. Some things are worth dying for, worth killing for. To some men these things are food, their own lives, or power over other men. These are all material factors. Communism is the belief in material values. These, then, are Communist motives.

Non-Communists fight for food and self-preservation also. But all non-Communists the world over share additional motives. In America despite wide religious differences, there are basic religious principles common to all, churchman and non-churchman alike. These are: love of all forms of freedom, faith in the fundamental discerning wisdom of the free electorate, and belief in the practical effectiveness of the Golden Rule. Regardless of what form God takes to the American Jew or the American Christian or the American agnostic, they all share a common faith in the value of these three spiritual principles. Other non-Communist nations hold to these and other spiritual doctrines.

Essentially, then, the conflict today is to decide whether any spiritual values shall be allowed to survive in the hearts of men. The outcome is worth dying for and killing for. It is also worth the best that we have to offer.

In any future war we cannot give anything short of our best—let us present a fighting team that will utilize all of the weapons in our arsenal. There is no chivalrous way to fight a war—we must fight to win

Teamwork Wins Wars

We have all heard how air power defeated Germany, how atom bombs knocked out Japan after sea power and air power defeated her, and how air power will decide any future global wars in a matter of days. Within the Army we have all heard how infantry decides all battles, armor is the only thing that can move on tomorrow's battlefields, and artillery is the only all-purpose, around-the-clock, all-weather weapon. But when we are fresh from combat, there is another theme that runs through our minds. What decides most squad fights? Does the BAR do it? Or does the M1 help a little? Of course, the M1 helps. Teamwork wins for the squad, just as it does for all infantry units. What wins for the division and above? Now it is a pretty big ball club—infantry, air support, armor, artillery, engineers, medics, all the services, and possibly naval support. Here it is definitely and primarily teamwork. So what wins for nations? Is it ground power, or air power, or sea power, or atom bombs, or propaganda? It is teamwork. Teamwork wins wars.

At Fort Leavenworth we learn the tactical application of this fact. Use centralized control for any major tactical unit whenever the situation permits it. Whenever possible, make a co-ordinated attack in preference to committing your force piecemeal. At Fort Benning we emphasize proper employment of all the com-

plex, diverse weapons within the infantry arsenal. Put everybody and everything to work. Teamwork then is the best that we have to offer. A properly balanced force—fusing the good from all the various weapons systems of modern war—is the best that we can put in the field.

This principle of balance is illustrated by our bombing experience in World War II. We found that a bomb load of mixed high explosives and incendiaries was more effective than a load of either used alone. The characteristics of one complimented the other so that the combination achieved a result well beyond the capability of either by itself.

Chemical Warfare

All the characteristics of Chemical Warfare compliment those of some other weapon. Gas runs downhill like water. Therefore it reaches men in foxholes where they are seeking shelter from other weapons. However, gas warfare has not been subjected to the crucial test of combat for several decades. It is interesting to consider how it might team up with modern weapons should it once be used in battle.

For instance consider a penetration of heavy fortifications in hilly or mountainous terrain. Command of the high ground is the deciding factor in mountain warfare. Success depends on seizing the enemy-held peaks. Korean experience has demonstrated the severe limitations of all explosive weapons when used against personnel protected by deliberate fortifications. Even atomic weapons would have little effect on men in deep caves and bunkers such as the Chinese and North Koreans built in the line that ran from the Sea of Japan to the Yellow Sea. In any normal landscape—under weather conditions which make a gas attack possible—war gases could be used to seep into these holes, diffusing around the baffled entrances to penetrate to the heart of the target, the enemy personnel.

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Mountain Warfare

However, this very valuable characteristic makes the classical techniques of gas attacks of only limited use in mountain warfare. Reserves, artillery positions, supply installations and the like will be found in valleys, it is true. But the key to the course of the battle, the actual fighting positions themselves, are high up next to the crest.

How then could we make a war gas descend into enemy dugouts but still remain on top of enemy mountains without drifting away into ineffective dilutions in the valley below?

The modern arsenal contains a combination of weapons with which this can probably be done. They are mustard gas and the atom bomb.

The preparatory bombardment for the penetration of a mountain fortress line might begin in the late afternoon—perhaps an hour before the regular nightly onset of the weather conditions under which a gas cloud settles to the ground rather than rising to useless dilution in the air.

For the first hour the established technique of high explosive shelling and bombing might be pursued without change. As the favorable weather conditions (called *inversion*) set in, let the shell filling change to mustard gas. Call in the air, the navy, the infantry mortars and the chemical weapons battalions. Use everything capable of putting mustard gas on the known enemy fighting positions in the sector selected for the actual penetration, probably a narrow regimental front. Establish a toxic concentration of mustard vapor along the enemy-held ridges and peaks as fast as the delivery capability permits.

Continue a light bombardment with high explosives to attack the few who are instinctively intelligent enough to climb uphill and upwind away from the vapor sinking into the emplacements, the bunk-

ers, the dugouts and caves. Maintain the mustard contamination by a steady rate of refreshment throughout the night.

Mustard Gas

Mustard gas is actually a liquid at normal temperatures. Dispersed on the enemy position the liquid will not drift down to be wasted in the valley below. It will remain where it is dispersed and will give off its vapor at a rate which is dependent upon the weather. The vapor is actually a gas and acts very much like any other gas—seeping down into the excavations, diffusing past the baffled entrances to personnel shelters and, of course, also drifting downhill to ineffectiveness in the valley below. However, the liquid remains in position on the crest for some hours giving off vapor continuously. Contact with either the vapor or the liquid produces casualties.

The technical requirements usually accepted for military results from such bombardments is that the concentration be maintained on the enemy for 4 hours. With refreshment at reasonable intervals, effective concentrations can be maintained in the enemy emplacements throughout the night.

Protective Measures

Should the enemy not have protected lungs and eyes—with tight fitting gas masks in serviceable condition—the requirements are less. However, the most probable protection to the hostiles would include gas masks but would not include the impregnated clothing necessary to hold the vapors from body-contact.

Another factor demanding consideration would be the downwind hazard to friendly troops in the event of a head wind. However, we would have the benefit of the downwind dilution in the travel of the cloud to our lines. Moreover, our troops could be masked and clothed in impregnated uniforms to the point where the

downwind hazard is acceptable. Should we be so fortunate as to have a tail wind blowing from our lines to theirs, our problem would, of course, be much more simple.

About 12 hours after body exposure to sufficient mustard vapor, the initial symptoms of poisoning appear. After 3 or 4 days the maximum effects are realized, but the initial reaction is sufficient for significant military results. In severe cases, nausea, vomiting, and prostration are frequent.

Gas Attack

About attack time the next morning—say 0400—the effects of the mustard bombardment are beginning. Classical gas tactics for use of mustard offensively dictate that the contaminated area be bypassed and reduced later. Whenever this is possible, it is the preferred course. What about the determined fanatical defense that continues to hold the position despite the mustard, climbing away from the low-lying pools of vapor and liquid but still clinging to the position? As time passes natural evaporation, rain, and other factors reduce the concentration to tolerable levels. Possibly the enemy is able to relieve the gassed troops. Suppose the position cannot be bypassed for other reasons? What good has our mustard bombardment done when we cannot send our troops into the contaminated area to exploit its effects?

Atomic Attack

Here the atom bomb makes possible the use of mustard as an assault gas. Detonate an air burst fission weapon directly over the contaminated hostile position at about 0500. The mustard will have done its work underground, the bomb will do its work above ground. Hostiles who have survived, relatively unscathed, by staying out of the holes will be hit by the multiple effects of the bomb. Moreover, the thermal energy of the bomb will probably

burn the mustard contamination off an area just about large enough to be a regimental objective. Depending on the details of terrain it may be necessary to call for supplementary air strikes with fire bombs against the deep canyons that may have been defiladed from direct line of sight to the point of the atomic explosion.

Our troops would have to carry masks and wear protective clothing. Possibly they might use their flame throwers to burn off any residual pools of liquid mustard encountered. But with the air burst atom bomb detonating at 0500, and the supplemental fire bomb strikes completed at 0530, the infantry could jump off at 0545, supported by all the tremendous explosive fire power so highly developed by our armed forces. The likelihood of their meeting determined, co-ordinated, organized resistance as they launch their final assault—following the lifting of the fire to the reserve positions—would probably be much less than it is after any of the preparatory bombardments used in combat up until now.

Our Best

This would be teamwork among modern weapons. Once we had been committed to the fight, this would be giving it the best we have to offer.

Of course gas warfare development has carried far beyond the old, battle-proved mustard gas. However, the new developments, including the refinement of toxic warfare into infectuous warfare using germs rather than molecules, are still classified to one degree or another and cannot be discussed here.

One word should be said about the ridiculous Communist charges that United Nations Forces have already used germ and gas warfare in Korea—either or both. It should be evident from the picture outlined above, together with the widely acknowledged proficiency of Americans in chemistry and biology, that should we ac-

tually use gas or biological weapons, there will be absolutely no question about it whatsoever. The effects would be so great as to defy any possible denial! The troops attacked would suffer a major calamity. Certainly we are developing both these weapons systems and so are the Communists. Both may be used in battle someday. However, there has been no American gas attack launched since World War I and never any American biological attack.

Other arguments are presented against the use of atomic weapons and gas in addition to the traditional prejudices inherited from the medieval code. Some people believe that so long as we do not initiate nuclear, toxic or infectious warfare that these horrors will be spared from mankind by a sort of unspoken gentleman's agreement between the belligerents. This is very dangerous reasoning. Every effort must, is, and will be made to avoid war. However, the military history of mankind repeats and repeats demonstrations of the disaster that results from fighting with less than the entire strength available. Many potentially superior forces have suffered defeat while large portions of their strength remained idle—unused and therefore useless.

The Korean Conflict

Korea is unique. Had the Communist forces been favored with anything approaching the combat organization and equipment of the United Nations Forces, nothing short of the war-proved doctrine of success based on offensive action employing all available means of striking the enemy everywhere he can be reached, would have prevented our suffering complete defeat. In other words, a heavy-weight fighter can loaf through a fight with a welterweight, but he had better give it all he has when he fights somebody his own size.

There is no practical preventive for active atomic, chemical, and biological

warfare other than to prevent war itself. The military effect to be realized by the initial impact of these weapons systems is so great that the belligerent who deliberately foregoes their use is deliberately courting extinction.

East-West Strengths

In addition to the lifesaving time for preparation which we have been blessed with in the past, we have had the additional blessing of overwhelming potential strength in all the wars we have fought, since the War of 1812. Our ultimate strength versus that of Mexico, the Confederacy, Spain, the Central Powers, and the Rome-Berlin-Tokyo axis was overwhelming. However, should we fail in our present efforts for peace, our potential strength combined with that of our allies lies in no such favorable ratio. In fact, as time passes and the Communist nations develop the industrial resources of the areas they control and narrow the gap that we believe we hold over them in atomic weapons, the relative strengths grow even less favorable to us. The Communists have developed and are maintaining their capabilities for chemical and biological warfare. Despite our tremendous potential in these fields and despite our own well-known program of gas and biological warfare preparedness, our relative over-all military potential in all fields is not sufficiently superior to that of the Communists so that we can afford to spot them the advantage to be realized from the initial impact of this type of fighting.

Western Advantage

American chemical and biological industry has a greater advantage over the Communists than any other phase of the two competitive economies. The day when we can deny ourselves this advantage has passed. We cannot afford to risk defeat with so much of our strength idle, unused, and therefore useless.

The most encouraging development of late has been the rumblings of the possible weakness behind the Iron Curtain. Possibly the Communists will abandon their devotion to the idea of world conquest. Possibly some evolutionary mellowing of the two competitive philosophies will reduce the present world tension to the point where a United Nations, with real teeth in it, could give real expectation of an extended period of world peace. But until we have material guarantees that our freedom is not threatened we must stand ready to fight to preserve it if necessary.

Preparedness Necessary

In any future fight let us not give it anything short of our best. Let us present a fighting team that uses all the weapons in the arsenal. There is no chivalrous way to fight a war. There is no possible way to fight except to win.

We should announce publicly that should we be forced to take the field again, we will do it with all the strength at our command—atom bombs, gas, and biological weapons included. There is much to work

out in the co-ordination of these weapons so that their results may be properly exploited, realizing their contribution to the combined arms mission of destruction of the enemy's armed forces and of his will to fight. If we know that any future campaigns will definitely employ these weapons, realistic planning, training, and preparation can be applied to a field where the native industrial genius of America assures us of superior potential for years to come.

The horrible fear in the minds of all men of good will is the thought of first—their own loved ones and other non-combatants suffering the impact of such a war fought with modern weapons. Using less than our maximum strength will not prevent this tragedy. Any war is a tragedy. The death of a 21-year-old soldier has all the import of any other death. If we would prevent modern war, we must prevent all war. If we are forced to war, we must fight it with all weapons—and fight to win. We would be fighting to decide whether any kindness, love, or charity is to be permitted to remain in the hearts of men.

Scientists and engineers are impersonal in their approach, and their interest lies first in perfecting new knowledge. But they are also members of the human race, and the greatest built-in gimmick that any human being has to insure peace is his desire to stay alive.

Secretary of Defense Charles E. Wilson

DIVISION PLANNING AT THE RIVER LINE

Colonel H. F. Cameron, Jr., *Corps of Engineers*
Instructor, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

CURRENT doctrine places the assault of a river line in the category of *special operations*—the same category which includes other operations that are infrequently performed and which require the services of highly trained technical specialists.

Such classification of the river-line assault may be appropriate from a limited technical aspect. However, the term "Special Operation" tends to emphasize the technical aspects to such an extent that the basic considerations governing the operation may become submerged in the maze of technical details.

The crossing of a river, which is defended by hostile forces, will be performed so frequently by ground forces that familiarity with the execution of the operation is mandatory for officers of all arms.

General J. Lawton Collins, in the November 1952 issue of *Combat Forces Journal*, said, "It's time to stress the fundamentals." He pointed out that each officer should become so well grounded in

fundamentals that he would employ the combat means available to him in the manner best suited to the situation prevailing at the time. He further stated, "Our basic concept of attack gives every one of you a great opportunity to be flexible in your planning—in your use of formations—your orders."

These remarks by the former Army Chief of Staff indicate that the approach to tactical problems should be made from the standpoint of the fundamentals involved. The fundamentals of an operation should be so ingrained in the mind of the individual officers as to make the planning and execution the opportunity to use our flexibility of thinking, our individual ingenuity, and the means available to us in a manner most likely to ensure success.

For many years the detailed planning for the river-crossing operation has been considered an "engineer job." Its planning and execution have been so tied to the technical intricacies of the equipment used, that the major portion of river-line planning has been left to the engineers. If we are to develop the "maximum flexibility in our planning—our formations—and our orders" and utilize the terrain and supporting means in the most economical and forceful manner, officers must be able to plan the operation to develop

In a river crossing, the forward movement of troops and supplies must utilize roads and crossing means to maximum capacity without providing targets which will be profitable for mass-destruction weapons

the full capabilities in the existing situation.

A sound plan is like a completed jigsaw puzzle with each piece fitted into its proper place. In the tactical puzzle, the individual pieces vary in size and shape as the situation changes and with the availability of information (see Figure 1). The problem is to have all of the pieces fit neatly together at the time the operation is executed.

Before starting to assemble the puzzle it is good practice to arrange all of the pieces neatly in front of you in order that they may be studied individually. This is essential in order that the factors which may cause the pieces to vary under different conditions can be determined and considered.

Field Manual 31-60, *River-Crossing Operations*, points out in detail the pieces used and the factors which cause the pieces to vary. This article will present an orderly approach to the planning for an operation and will be limited essentially to the fundamentals involved in the development of a scheme of maneuver at division level.

The assault of a river line is an offensive operation to overcome a particular type of obstacle. The crossing is not the end sought, but rather the means to that end, the immediate objective being to cross the river as quickly and economically as possible to enable the command to proceed with its mission on the far shore.

An obstacle imposes restrictions which

must be analyzed in order to determine the manner of overcoming it. In a river-crossing operation definite restrictions are imposed on maneuver, control, the withdrawal of units once committed, logistical support, and the requirement for specialized troops and special equipment.

Knowing these restrictions, and recognizing that a good plan must consider each of them in relation to the existing situation, the planning for a river crossing can be broken into basic steps, and each step fitted into the over-all plan. Although each of these steps will be discussed separately, it is emphasized that no single step can be completely divorced from the others. The five steps to be considered are:

1. Developing a scheme of maneuver for advancing on the far shore.
2. Phasing of a river-crossing operation.
3. Developing an assault crossing plan to implement the scheme of maneuver.
4. Allocation of troops and equipment for the assault operation.
5. Crossing of logistical support for maintaining the momentum of the attack.

The fact that there are so many restrictions in a river-crossing operation has probably been the most confusing part of its planning. The breakdown into component parts and a step-by-step approach to the problem will eliminate a large portion of the confusion and permit the planning officer to analyze each portion of the plan in its true perspective.

Scheme of Maneuver

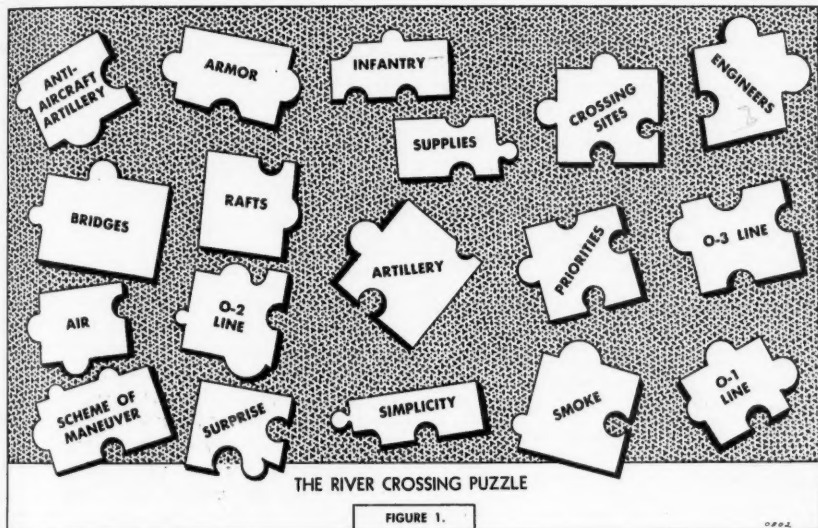
Remembering that the assault of a river line is an offensive operation, the first logical step in the development of a crossing plan then becomes the development of a scheme of maneuver.

The basic approach to the development of a scheme of maneuver is *backward planning*. To elaborate upon this and to stress the fundamentals involved, first

Colonel Harry F. Cameron, Jr., a graduate of Stanford University, is the author of "Don't Get Caught With Your Bridges Down" which appeared in the June 1952 issue of the MILITARY REVIEW. During World War II Colonel Cameron served in Europe with the 28th Division, Engineer Section, Third Army Headquarters, and commanded the 164th Engineer Combat Battalion. He graduated from the Command and General Staff College in 1950 and has been an instructor at that College since 1951.

consider the operation without the river line and the restrictions it imposes upon the problem. The bridgehead line or final objective will usually be given by higher headquarters. Certain objectives must be seized to secure that line. Study the possible avenues of approach to these objectives. Determine which of these avenues of approach to use, and select and mark

River-crossing operations are divided into three phases, each of which is based on the attainment of certain objectives prior to proceeding to subsequent objectives. These phases have a definite effect upon the execution and progress of the operation because they are control measures and as such restrict maneuver by imposing requirements for specific action on



the intermediate objectives along them which are necessary to control and facilitate an attack. Then consider the enemy dispositions, weather, terrain, and the routes of communications as they affect each of these avenues of approach. From this estimate a tentative scheme of maneuver on the far shore is selected. Figure 2 illustrates such a tentative scheme of maneuver. This is how you would *prefer* to advance on the far shore if no river restrictions entered into the situation.

Phasing the Operations

In developing the tentative scheme of maneuver, intermediate objectives are marked along the avenues of approach.

attacking units during the course of the advance.

In consonance with usage at the Command and General Staff College, lines are used to delineate these special phases (see Figure 3). These lines are designated O-1 for the first phase, O-2 for the second phase, and O-3 or bridgehead line for the third phase. It is emphasized that each phase line is tied to the river and is determined by *terrain objectives* which are necessary to place limitations upon enemy fire in relation to operations at the river line. The use of these phase lines is not intended to limit the commander's prerogative to select other objectives which he considers necessary to accomplish his

mission or to control his advance nor to designate additional phase lines to facilitate this control.

Phase One

Phase One is defined as the securing of objectives which will eliminate the enemy's capability of placing *effective direct fire* on the crossing sites. When this phase is completed, the crossing of troops and equipment by boats, rafts, and footbridges is facilitated. To evaluate this definition, the basic technique of crossing is considered. The first waves of the assault echelon cross the stream in assault boats and proceed immediately toward the objectives selected as necessary to accomplish the first phase. As soon as the enemy fire is reduced or made ineffective, rafts will be constructed for the crossing of tanks and vehicles to reinforce the assault on the far bank. To be effective, direct fire must sustain sufficient hits at the river line to stop or impede seriously the ability of the units to cross the river. Direct fire includes fire from tanks, emplaced artillery pieces, and recoilless rifles, in addition to small arms. The targets presented to this fire in a river crossing are small and fleeting, and this fact tends to shorten the range to which the fire of these weapons is effective. Considering the full implications of the word "effective" and the targets presented, the seizure of selected terrain features between 1,400 and 2,000 yards which have observation of the river will normally accomplish this phase.

Phase Two

Phase Two is defined as the securing of objectives which will eliminate the enemy's capability of placing observed fires on the selected crossing sites. Superficially, this statement of observed fires indicates that seizure of objectives near the limit of visual observation (about 8,000 yards) will accomplish phase two. Most 0-2 lines fall within 6,000 to 10,000 yards of the

river. With improved fire control technique (particularly in terrain in which an enemy has retired and has survey control, checkpoints, and registration completed), electronic spotting, surveillance by high performance planes, and the use of VT fuses (particularly with medium and heavy artillery to deny the use of rather than destroy bridges), the factor of observed fire loses meaning and the range at which we can expect *effective* fire on the bridges is only limited by the range of the weapons used and the positions from which they are fired. It is believed that there are additional considerations involved in selecting an 0-2 line than just *observed fire*.

From this practical viewpoint it is more logical to consider what is actually accomplished during this phase of the operation rather than restrict our thinking to the phrase "eliminate observed fire." During this phase, regimental control is re-established and the division commander can make the first valid estimate of the progress of the operation. The advance should have progressed sufficiently to endanger the integrity of the enemy position.

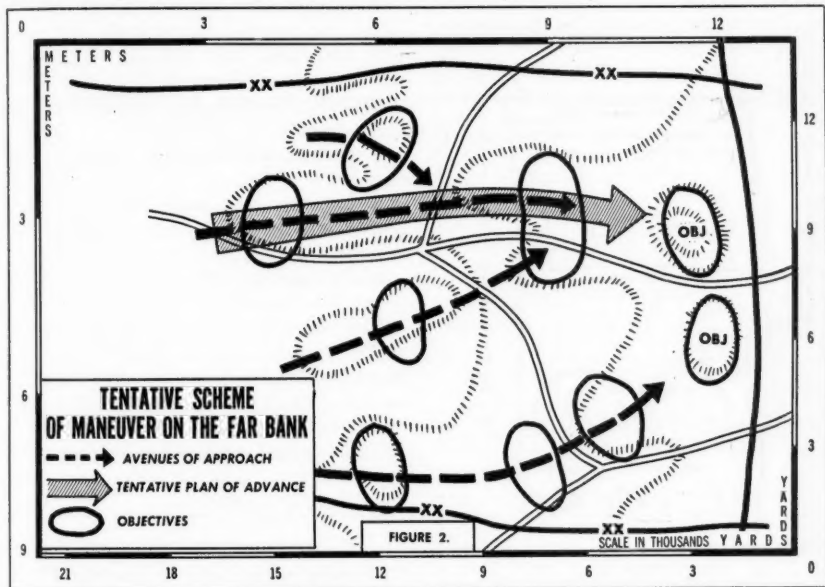
It can be expected, then, that during this phase the enemy will launch his strongest counterattacks and a decision from the division commander as to whether to continue the attack or dig-in temporarily will be forthcoming. Therefore, objectives should be selected which are suitable for reorganization and ease of defense. These added considerations—although not specifically pointed out in our text—are realistic concerning present-day capabilities and indicate an objective line capable of being defended against counterattack. The securing of the second phase objectives and the elimination of the enemy's effective observed fire permits the construction of tactical bridges.

Phase Three

Phase Three is the securing of objectives which eliminate the enemy's *effective sus-*

tained fires of ground weapons on selected crossing sites and provides space on the enemy's side of the river for maneuver of the command. The fact must be accepted that the fire of some ground weapons may continue to fall at the river line after objectives on the 0-3 line are reached. However, to be effective, this fire must be sufficiently accurate and of such fre-

Based on these considerations the elimination of the enemy's medium artillery fire from the crossing sites is usually considered as meeting this requirement. However, the enemy's capability of using very heavy artillery or other means of delivering atomic warheads may completely change this phasing. The maneuver space for the command is the second require-



quency as to halt or interfere seriously with the operations at the river line.

Raft sites are not especially endangered by occasional rounds since there is so much movement that the occasional round is more harassing than effective. The widened steel treadway bridge, once in operation, is not seriously damaged by conventional artillery fire.

The treadway itself is not susceptible to serious damage from direct hits and the puncturing of floats causes only a temporary halting of operations—unless engineer supplies are so critical as to preclude replacement.

ment in determining the 0-3 line. A river crossing may be an army, corps, division or task force operation. The space for maneuver of the force is predicated upon the size of the unit making the crossing and should be sufficient for maneuvering reserve units and for the establishment and stocking of adequate logistical installations to support the breakout from the bridgehead.

Assault Crossing Plan

The next step is to develop an assault crossing plan to support the tentative scheme of maneuver and to seize the ob-

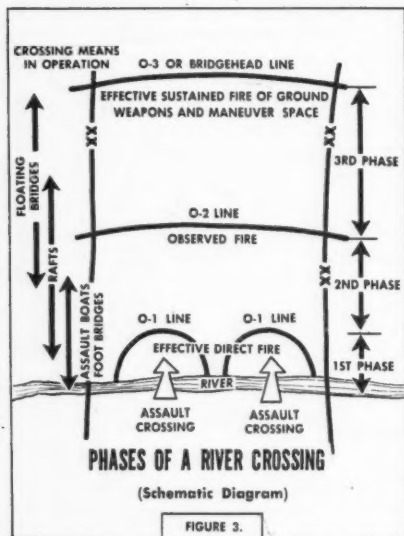
jectives which determine the phases of the operation. One of the first decisions in formulating this plan is whether to cross on a *broad* or *narrow* front.

The advantages and disadvantages of each type of crossing are considered.

Attack on a Broad Front

The advantages of a broad-front attack are that it:

1. Lessens vulnerability to enemy fires.



2. Conceals the main effort initially.
3. May develop weak points in the enemy's defenses.
4. Forces the enemy to disperse to meet all of the attacks.
5. Crosses more troops initially.
6. Provides greater opportunity for maneuver in exploiting success.
7. Lessens vulnerability to mass-destruction weapons.

The disadvantages of a broad-front attack are that it:

1. Disperses effort and supporting fires.
2. Increases the difficulties of maintaining tactical control.

3. Increases the engineer equipment and personnel requirements.

Attack on a Narrow Front

The advantages of a narrow-front attack are that it:

1. Permits supporting fires to be intensified.
2. Simplifies tactical control.
3. Occasionally gains surprise by the speed and power of the attack.
4. Decreases the engineer equipment and personnel requirements.

The disadvantages of a narrow-front attack are that it:

1. Permits the enemy to concentrate his fires.
2. Indicates the main effort quicker, permitting the enemy to concentrate his reserve units.
3. Provides a better target for mass-destruction weapons.

The desirability of attacking on a broad rather than a narrow front is evident. However, the final decision must be based on an estimate which considers the number of suitable crossing sites, the availability of engineer troops and equipment to operate crossing sites, and the enemy disposition and capabilities.

Crossing Sites Selection

Crossing sites canalize operations into very narrow zones at the river line and frequently require the advance on the far shore to proceed in a manner other than that most desirable.

Requirements for assault crossing sites are both tactical and technical (see Figure 4).

It is seldom that any one crossing site will meet all of the requisites that are listed in Figure 4. In fact, many desirable requirements will be missing at each site. To evaluate properly the available sites, each one should be rated separately, first on the technical requirements, and then on the tactical requirements. These rated

sites are then considered together as they contribute to, or detract from, the tentative scheme of maneuver on the far shore.

The technical considerations of each crossing site will be presented by the unit engineer when he informs the commander of the number and location of sites which are available. He will rate each site, the rating indicating the ease with which the engineering portions of the crossing plan can be executed at the site.

The commander or planning officer considers the sites tactically to determine

and deciding what shall be the determining consideration in the existing situation. The sites rated best from technical considerations may not be positioned to support a sound tactical plan, and similarly the sites desirable from a tactical standpoint may present technical difficulties. Study of the crossing sites located in relation to the tentative scheme of maneuver will aid immeasurably in the final selection of the sites to be used. The crossing sites selection will indicate the modifications required in the tentative scheme

TECHNICAL	TACTICAL
Width	Mission
Depth	Enemy Situation
Velocity	Road Net
Banks	Cover and concealment
Obstacles (in the river)	Observation and fields of fire
Approaches	Obstacles (other than river)
Equipment park locations	Own Situation
	Training and experience of troops

FIGURE 4.

whether they will support a sound plan of advance on the far shore and whether they contribute to the prompt accomplishment of the special phasing of a river crossing. To the sketch of the tentative scheme of maneuver on the far shore (Figure 2), is added the river and the location of the crossing sites with their *technical ratings* (Figure 5). The crossing sites superimposed on the tentative scheme of maneuver show how each crossing site is related to the *desired* tactical plan of advance.

This is the point at which the key decision is made in determining the scheme of maneuver. The selection of each crossing site entails a careful weighing of both the technical and tactical considerations

of maneuver to produce the actual scheme of maneuver to be employed in the operation.

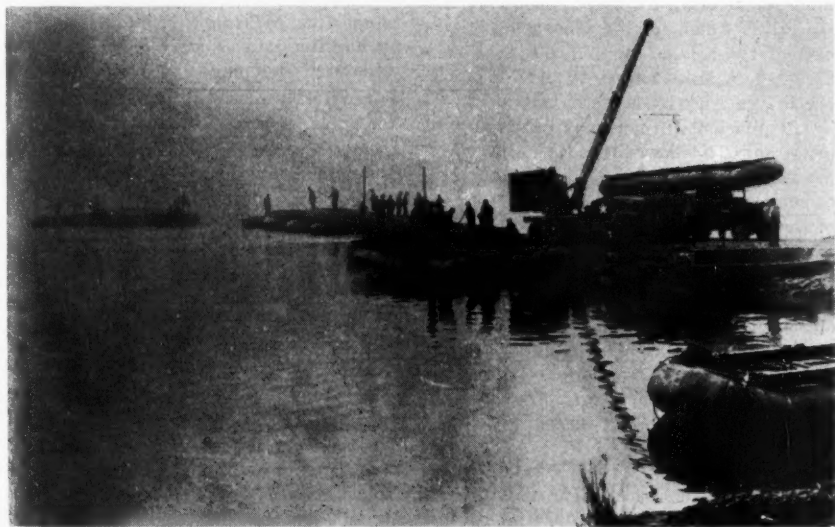
Troops and Equipment

The crossing equipment and special troops which will be required to transport the assault troops and equipment across in the number and order which will be required to implement the scheme of maneuver is contained in the engineer plan—the technical details of which are actually the staff engineer's job.

However, the division planning officer must be able to make the changes and revisions which are necessary to bring the technical and tactical aspects of the operation together into a workable plan. To



When assaulting a river line, the object is to cross the river quickly to enable the command to proceed with its mission. Above, American soldiers, in an assault boat, crossing the Moselle River in Germany. Below, American engineers, partially concealed by smoke, constructing a ponton bridge across the Moselle.—Department of Defense photos.



infantry support raft. A treadway raft can be constructed by a platoon of engineers in approximately 45 minutes and can be operated by a squad of engineers. For planning purposes 6 round trips per hour can be made on a 500-foot stream.

The advent of guided missile warfare and atomic artillery, in addition to improved fire control technique in conventional artillery, may well delay bridge construction in future operations to the point where all division operations, for several days after the assault crossing, may be supported by rafts rather than by bridges. The widened steel treadway bridge is a floating bridge which is normally constructed in a division zone by supporting engineer units. Whether the engineers for the bridge construction are attached to, or placed in support of, a division will depend upon the importance which higher headquarters places on the division's crossing in relation to the over-all scheme of maneuver. Regardless of the command relationship, the division has the following factors to consider: (1) the tactical plans must ensure prompt seizure of the objectives which facilitate early construction of the bridge and (2) the priorities assigned to units and equipment to cross the bridge when it is constructed.

The division will normally be given priority on a bridge within its zone, this priority being either in a specified number of vehicles and convoys or complete control of the bridge for a definite period of time. In the latter case the division will be responsible for establishing priorities and the control of all elements crossing. The allocation of priorities must be considered in the division logistical planning to ensure the early crossing of necessary resupply and the prompt establishment of supply points on the far shore.

Fire Support Elements

With a scheme of maneuver determined, and the combat units and supporting equip-

ment properly allocated, the employment of available fire support elements is considered. The problem is to obtain the maximum support from every means available.

The Air Force must perform its usual missions of gaining and maintaining air superiority, interdiction of the battle area, and furnishing long-range reconnaissance. These missions are normally co-ordinated and directed at higher echelons.

The division is more immediately concerned with the close air support that can be obtained during the crossing.

Requests for air missions should be integrated into the fire support plan.

Artillery support is continuous throughout a river-crossing operation. Plans include the orderly and early displacement of the light artillery across the river to ensure that continuing artillery fires are provided to support the advance on the far shore.

With ample time for planning, the fire support plan may be prepared in greater detail than is possible in most operations, which will result in greater flexibility. Supporting fires may be intensified, since ammunition can be stock piled and counterbattery fires may be more effective with more time for accurate target location.

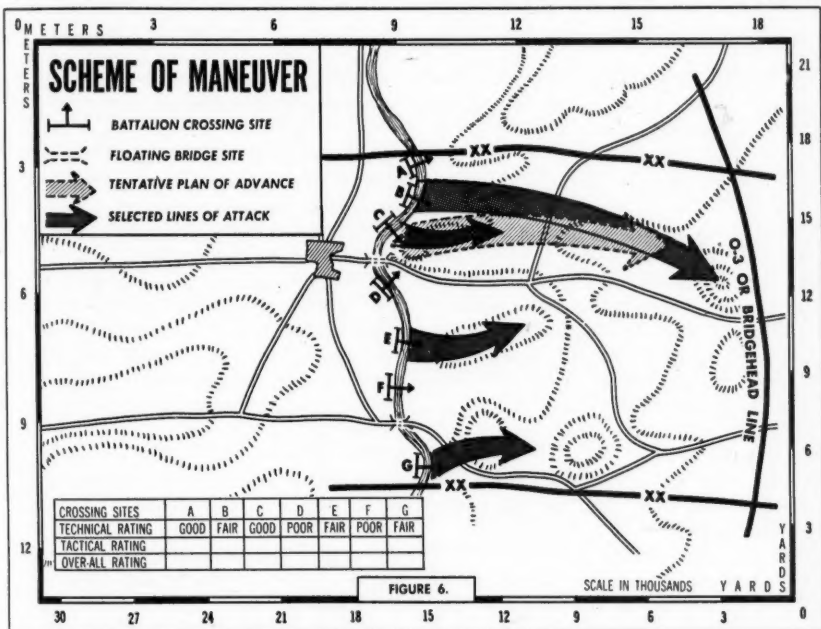
The primary mission of the antiaircraft artillery in a river-crossing operation is protecting the bridge sites. Since the bridges are not installed immediately, the antiaircraft artillery can be employed to protect crossing sites, troop assembly areas, equipment parks, and critical points within the division zone. In addition, the automatic weapons may be effectively used for direct support during the assault crossing if air superiority frees them from their primary antiair role. When the automatic weapons are used for direct fire, they provide a potent direct fire weapon to the crossing units; and at the same time the weapons are in position for an early crossing which enables them

to go into position to protect the bridge sites when work is started there.

Tanks are employed for direct fire support of the assaulting units until such time as their fires are masked. This use also places them in position for early transportation across the river. Because of the extreme vulnerability of the ground troops which have crossed the river, tanks are usually the first vehicles crossed when

Logistical Support

This article so far has been limited almost entirely to the G3 aspect of the operation. This is not an attempt to minimize the parts played by the other general staff sections. The G1 and G2 portions of the planning have been omitted. However, it would be hard to conclude an article on planning for a river crossing without a brief summation of the logistical



the means for ferrying them are put into operation. Smoke is particularly useful as a screening measure to limit the enemy's capability of observing operations at the river. This permits the speeding up of all tasks which are dependent upon masking observation. The state of training of our troops for operating within a smoke screen, the weather conditions, and the plans and operations of adjacent units, must be carefully considered in making the decision to use or not to use smoke.

support plan, since it too must utilize the same limited means for forward movement as the operations plan. The two plans are developed concurrently because very close co-ordination between them is necessary. They must divide the limited capacity for forward movement in such a manner as to complement each other and provide the supplies which are necessary for the movement of the assault echelons.

The logistical plan should be based on two precepts:

1. The forward movement of troops and supplies must utilize the road net and the crossing means to their maximum capacity without providing targets favorable for the enemy's employment of mass-destruction weapons.

2. The forward flow of troops and matériel should proceed in the proper sequence and quantity for maintaining the momentum of the attack and the building up of the reserve forces on the far shore for a prompt breakout from the bridgehead.

To assure the attaining of these objectives the plan must be worked on in detail at all levels, then reviewed and revised at division level. In its final form the plan should ensure that:

1. Units crossing in the early phases of the operation carry, in addition to their basic load, emergency rations and extra supplies which will enable them to overcome temporary delays in operations at the river line. The establishment of small unit supply points at crossing sites is highly recommended.

2. Priorities are established and maintained concerning *who* and *what* may cross the river.

3. The need for emergency supplies is anticipated and that plans are made for furnishing them.

4. Strict traffic control on the roads and bridges and centralized control of the forward movement of all crossing ele-

ments will effect full utilization of all crossing means available.

5. The establishment of supply points on the far shore and the build-up of supplies is started early in order that the necessary support is available when needed to continue offensive operations for the breakout from the bridgehead.

Conclusion

A river crossing is a combined arms operation and one that will be performed with sufficient frequency by ground combat units to warrant familiarity with the fundamentals involved.

The planning for a river crossing should be broken down into a logical sequence of events which will simplify the problem of planning. Reverse planning is recommended to facilitate the formulation of a sound workable plan.

The restrictions imposed by a river and the requirements for sound decisions for overcoming these restrictions give the commander or the planner one of his greatest opportunities to display his "flexibility of planning—organization—orders."

The finished plan should permit the commander to execute the operation with all available means, to attain and maintain the maximum forward momentum of the attack, and to shift his means in order to exploit success at any point where it appears possible.

Modern warfare demands that our combat forces possess maximum possible mobility. Both in defense and in attack, mobility is essential and it cannot be achieved against a modernly equipped enemy without large numbers of dependable vehicles. In one infantry division alone more than 2,500 motor vehicles are necessary to support the division in combat. If these vehicles are not available, the striking power of our forces are greatly impaired and our defensive strength is greatly reduced.

General J. Lawton Collins

MILITARY DELINQUENCY AND SERVICE MOTIVATION

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE cause of delinquency, like that of human behavior generally, certainly cannot be sought in a single and simple factor. A multiple causational theory has to consider numerous variables and their interaction.

A factor ordinarily contributing strongly to the final commission of the delinquent act is some disturbance in the development of the offender's super-ego. Developmentally, the defect in the functioning of the super-ego—which so often constitutes a major source of delinquency—may be attributed to three possible causes:

1. An adequately strong super-ego did develop but, because of identification with a delinquent individual or a delinquent group, the values acquired are socially not acceptable.

2. A super-ego did develop in agreement with the values held by society, but it breaks down due to excessive demands upon it. The typical example might be the

minister's son, who unable to live up to the rigid demands put upon him, finally becomes delinquent.

3. "Absence" or weakness of the super-ego because of lack of identification.

Motivation for military service is largely dependent on the degree to which the super-ego of the young American, as well as of his family and home community, encompasses the obligation to serve his country.

In working with military offenders, one is struck by the complete lack of understanding of the social and public character of military service. Large numbers of individuals with a well-developed, often rigid, super-ego, young men who are considered exemplary neighbors and citizens, are at a complete loss to accept and to assimilate the fact that enlistment and draft are not a private contract resulting in a job which one quits if one does not like it. They—and most important, often their relatives and friends—to quote Major General David Shanks, "do not understand the difference between the man who in private life makes a bargain and later changes his mind, and the man who raises his hand and takes a solemn oath to serve his country and then breaks his oath."

The cause of delinquency, like that of human behavior in general, certainly cannot be sought in a single and simple factor. A multiple causation theory has to consider numerous variables and their interaction

A newly committed offender when interviewed will often explain his desertion by stating with an impressive naivete and without any guilt feelings, "I didn't like it, so I took off," or "I was not paid in time, so I took off—no pay no work." Many offenders make similar statements which indicate their lack of understanding of the situation in which they find themselves.

Disciplinary Barracks

Only those Army and Air Force offenders who are found guilty of an offense severe enough to be tried by a General Court-Martial are committed to a United States Disciplinary Barracks (USDBs),—and not even all of these. Of the five United States Disciplinary Barracks, the one at Fort Leavenworth, Kansas is the maximum security installation, and one can, therefore, rightly expect to find the more serious behavior problems there.

Approximately 60 percent of the inmates there are deserters. A study of the deserters committed to that institution during the months of January and February of 1952 by Welton showed that 78 percent of them had no juvenile record, 65 percent had never been arrested in civilian life—not even for a misdemeanor—and of the 35 percent who had previous arrests only about half had been committed to an institution—the rest having been found either not guilty, or fined, or released on probation.

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Historical Background

The lack of motivation for military service in Americans has plagued our military leaders and statesmen ever since the Revolutionary War. Attempts to attack it in a problem-solving attitude were often clouded by dealing with symptoms as if they were causes and by making assumptions which appear not to be confirmed by facts.

A symptom which appears to have attracted undue meaning is the fact that American tradition does not include more than a token peacetime Army. From this the rationalizing conclusion is often drawn that the same society once faced with the necessity of existing warfare is a "nation readily springing to arms." We are inclined to think, particularly of the Revolutionary War, of such electrifying associations as are produced by Willard's famous painting, "The Spirit of '76," or by Emerson's "Embattled Farmer" who fired "the shot heard around the world." Beginning with the Revolutionary War and up to and including the conflict in Korea, this notion of a nation "readily springing to arms" is erroneous. It tends to prevent the actual adjustment and co-ordination of motivation for military service to motivation for other social duties.

The Revolutionary War

The largest army assembled during the Revolutionary War numbered 17,000 men. This force was raised during the enthusiasm at Lexington, Concord, and Bunker Hill. At no time during the Revolutionary War could more than two-thirds of the intended and authorized strength be assembled although in 1776 the bounties amounted to \$400. The Legislature of Virginia increased this to \$750, and included a suit of clothes, and a hundred acres of land for one term of enlistment. In spite of all these endeavors to bribe the youth of America to serve their country, Washington, in 1777, wrote to Congress that his

army consisted of fewer than 3,000 men and that more than two-thirds of these were to be discharged at the end of the month. General Enoch Crowder summarized the situation as follows: "... It took 7 years, with the aid of a foreign ally, for the American nation, then 3 million strong, to expel an invading force, the maximum strength of which was 42,000 men."

The War of 1812

In the War of 1812 the Army's authorized strength was 62,000 men. Although the policy of bounties to volunteers continued, at no time during that war could more than 32,000 be assembled.

The viewing of military service as a kind of private contract, and not as a civic duty, became even clearer in the Mexican War.

After the victory of Cerro Gordo, General Scott on his march to Mexico City had to send home 4,000 men—40 percent of his army—because their term of enlistment had expired.

This was required even though it forced him to wait for reinforcements—during which time the enemy reorganized their practically destroyed army into an effective fighting force.

The Civil War

In the Civil War the same attitude toward military service was demonstrated repeatedly. This attitude was clearest during the disastrous Battle of Bull Run, where whole units of Union troops in the Manassas area actually marched away as the fighting started because their time had expired.

Because the Spanish American War lasted only 109 days, and because it did not place too much stress on our manpower resources, it did not provide the proper stimulus for the nation to spring to arms. In spite of this the attitude that military service was being performed by an out-

group*, rather than by an in-group was shown in that war by the American press, whose partial function seemed to be to inform the enemy of every move which our military establishment contemplated.

The World Wars

One might have expected that the spirit of a definite, short-term military service—whether one is still needed by one's country or not—would have totally expired as the result of the draft system introduced in World War I. Although great numbers of World War II soldiers were the sons of drafted veterans of World War I, this spirit of term service continued. Of a carefully selected sample of 2,507 soldiers in the South Pacific (polled early in 1944), only 20 percent agreed with the following statement: "The main job right now is winning the war, and no man in good health has a right to go home until that job is done." Of the remainder, 65 percent disagreed with the statement and 15 percent were undecided. This attitude was expressed with most of the fighting still ahead—when most of the islands were occupied by the enemy and before the invasion of Europe had even started.

Volunteers versus Draftees

The problem of motivation for military service is often clouded and confused as being identical with the problem of volunteering versus conscription. By their very act of enlistment, volunteers appear to exhibit a stronger motivation for military service. However, a more detailed investigation into the motives of enlistment could answer the question of their actual attitude.

In daily work with military delinquents one is impressed with the large proportion of enlistees committed to military correctional institutions. Confirming such

*"Out-group" is a group to which one does not feel he is a part. The individual refers to such a group as "they" rather than "we" as he would refer to an "in-group."

general impressions, the referred to study of Welton shows that 69.6 percent of his sample of deserters were volunteers—thus only 30.4 percent of the deserters in his sample had joined the Armed Forces involuntarily. It should be remembered also that it was the volunteers who marched away at Bull Run, and who abandoned General Scott when his way to Mexico City lay open. It seems, therefore, that we should avoid connecting too closely the issue of volunteering versus conscription with the problem of actual motivation for military service.

Discipline and Teamwork

Another issue which has clouded the actual underlying problem is discipline. When the United States entered World War I, the German General Staff told the German people: "We have nothing to fear from America, for the soldiers of a democracy can never be disciplined."

It is true that all Americans are sovereign, they are brought up to live in and to appreciate an unauthoritative environment. However, this in no way implies that they are not disciplined. General Marshall has described discipline as a "cheerful and understanding subordination of the individual to the good of the team." Certainly we cannot say that the ability for such teamwork is lacking or even low in the American. The American's culture exposes him to the teamwork of highway traffic, of baseball, of the factory assembly line and workbench.

The problem, therefore, is not to create or even to increase the ability for cheerful and understanding subordination for teamwork, but rather to utilize this capacity for military purposes.

Armed Forces Acceptance

It appears from these considerations that the American is able to do his part well in a group. The problem of motivation is strongly associated with making

him more aware of the fact that the Armed Forces is his very own social institution.

That not only a large number of offenders, but also their families and friends, and often whole communities, consider their own Armed Forces as a definite out-group is evidenced by their attitude toward the military offender. Countless testimonials of neighbors, village elders, and mayors certifying that a certain offender is highly respected in his community and is considered to be a good citizen, that he never got into difficulty until "they" called him up, confirms the feeling that the Armed Forces is an out-group. That not so many years ago many states had to pass laws intended to prevent discrimination against the wearers of their country's uniform—with restaurants, theaters, dance halls, and other places of amusement being the chief offenders—confirms the trend to view the military as an out-group—if not to say of this specific case, an outcast. An English proverb says that the education of a gentleman should start a hundred years before he is born, and certainly the problem of identification of the American citizen with his Armed Forces contains long-range elements, to be planned for in terms of many years, as well as immediate problems, which arise when a young man enters the service.

Military Morale

Donald MacKinnon describes military morale as "wanting to do what one has to do," and although one may feel that such definition is too narrow, the paramount part which positive motivation plays in morale building is self-evident. The study of motivation for military service, of course, requires a systematic and detailed investigation of the needs involved and how these needs influence human thought. It raises, in particular, questions like, "What needs does military service satisfy

—which ones does it frustrate? What measures can be taken to reduce frustration and to increase the release of energy toward the desired goals?"

The sudden change to an entirely new kind of life threatens important ego needs and mobilizes huge amounts of anxiety. A sovereign up to yesterday, the young man, without any transition, finds himself under the order of corporate regimentation. He has to learn, and to do new things, and in a setting which is entirely foreign to him. He is without privacy and without women, a fact which could easily arouse latent homosexual anxiety. Most difficult of all, he has to live a life in which he feels unimportant as an individual. It is particularly because of the threat to the ego need of self-assertion, because of the fear of loss of identity, that motivation can hardly be kept up without the substitute of firm group identification. This necessity to derive fulfillment of the need of self-assertion, largely through group identification, is growing steadily as the advancing mechanization is making military performance more and more impersonal. Military service is increasingly losing the individual glamour which it had when fighting was an act of individual courage and strength. The further back in history we go, the more we find the hero to be the best individual fighter, whether he was a peasant or king. Stressing the law of individual recognition, the hero received the fullest share of the profits when the spoils were divided.

In contrast with this, the soldier of today is—as most vividly described by L. L. Bernard in his *War and Its Causes*—just a part of a vast fighting machine. Such rituals as "monuments and annual tributes to the Unknown Soldier," only testify—by this anonymous compensatory mythical personification—to the depersonalization of the hero of modern war.

Identification a Key Role

Thus, the threat of loss of identity is, from various points of view, a realistic one. And there are several reasons which make us suspect that lack of identification plays a key role in the multiplicity of causes which lead to the actual committing of a military offense. A study of the concurring psychological findings and psychiatric diagnoses at the Fort Leavenworth USDB shows that most offenders are not diagnosed as asocial or antisocial; the modal diagnosis at that institution is "emotional instability reaction," and "passive dependency reaction"—40 percent of them were thus diagnosed. The value of strong identification for passive dependent and emotionally unstable individuals—and the danger of poorly planned actions, where guiding identification is missing—is evident.

At this point it is interesting to remember that a definite majority of offenders are enlistees. Exact figures may be of only limited value, as one has to rely on the reasons given by the offender. However, at least one-third of the studied sample of deserters asserts that they joined to be together with friends or relatives, or they give as the reason for their enlistment unbearable home conditions, or that they had no other place to go.

That this figure of one-third is a conservative one appears supported by the findings that 48 percent of the offenders studied at the Fort Leavenworth USDB came from broken homes—certainly a much higher percentage than that given for the general population of the United States. The need for some identification for these youngsters, who lacked identification figures in their homes, as it appears, largely influenced their seeking the security of a family substitute in the Armed Forces.

The modal reason given for desertion by the group studied at the Fort Leavenworth

USDB is the feeling of being discriminated against in regard to passes, furloughs and duty assignments. In other words, the modal reason given for the offense is that the offender did not feel he was a part of the group. Exactly 50 percent of the studied deserters give either discrimination or that they were more needed at home—the reverse picture of the lacking group identification—as their reason for the offense.

Group Identification

What can be done to increase the feeling of group identification, to spread the satisfying, uplifting, and constructive conviction that everyone in the group, from private to general, is a partner in the ownership of the unit? Of the numerous possible considerations, the ones which follow appear to be particularly important:

1. An important variable in the development of such group feeling is not only the time the individual remains but expects to remain with the unit. Recently, administrative reasons have caused individuals to be trained in one unit, to go to the Port of Embarkation individually, to be shipped overseas with another group, and then to be assigned to an entirely new unit upon arrival. While it is not the task of the psychologist to judge the administrative importance of such disposition, it is believed that it is the military psychologist's duty to impress upon the administrators the psychological advantage of the previous tradition of staying with one's unit.

2. Distinctive unit insignia and hat pipings contribute to the identification. Each larger unit should have its own identifying patch.

3. Distinctive unit names would increase the in-group feeling. The restaurant owner knows that he sells more sandwiches if he gives them fancy names than if they were simply numbered. It is easier

to become enthusiastic for the Cardinals or the Yanks, or for Notre Dame, than for Club No. 1, No. 2, or No. 3. The strength of such desire for distinctive unit names in the American soldiers and airmen is shown by the fact that where units are not supported by established names they create them themselves—a platoon, a company, a plane or a tank, is often called or marked with a specific name. Most foreign nations support such desires of their troops by giving their units names which are stimulating to the imagination, invite identification, and the building up of traditional pride. The few units in our Armed Forces which have or had such names as the Rough Riders, and the Rainbow Division show particularly strong cohesion and an excellent combat record.

4. The large-scale, systematic use of music is indicated. Music is capable of reaching deeper emotional layers, and usually does so faster, than the rational approach. It lends itself particularly well in the form of group singing for the creation of in-group feeling. Those who have observed the unifying and enthusiastic effect which the singing of their university song has on college students will agree to a wider use of group singing in the Armed Forces. Many foreign nations have distinct, often very inspiring, marches for their regiments and divisions.

Marching in formation through a town singing—a practice widely utilized by other nations—increases in the unit the feeling of belonging together. The rhythmic mutual movements, of which the individual becomes a part, the common experience of the emotional impact of the music, the group character of the interest aroused in the flanking civilians, make the individual strongly aware of deriving security and satisfaction through membership in his unit.

Altogether, the potential of music for motivation for military service is worth detailed psychological investigation, and

practices which sprung up more or less "on their own" abroad should be systematically studied and enlarged upon.

It appears that Wagnerian music, and inspiring march music, as well as the use of group singing employed by the Germans probably had more to do with the military efficiency of the German soldier than is generally realized.

5. Even deeper psychological strata may be reached by the systematic use of meaningful symbols. Emotionally charged symbolic stimuli, object, as well as verbal symbols, may change a phlegmatic or hesitant attitude into enthusiasm and ardor.

The flag is one such symbolical, meaningful object. For many it has a fetish-like individual meaning, thus fulfilling deeply rooted needs and, therefore, exercises considerable power on the emotions of the individual. Verbal symbols, too, without much explanation, penetrate into deep strata. If sloganized, they might bring home the meaning of national solidarity easily. Short formulations like, "God and Country," "Old Glory," or "Give me liberty or give me death," belong within this category. A speaker in a civic meeting describing our reconstruction work in Japan would be more embarrassed by a shout, "Remember Pearl Harbor," than by a long rational refutation of the soundness of the program.

Militarism?

An objection might be raised that such measures as described here would lead to a spirit of militarism which would be strange to American tradition and to the American way of life. However, this objection would only lead us back to the

problem of motivation for military service in the American culture. The fear that strong identification with our own Armed Forces would lead to militarism appears more based in emotional predisposition, which might well border on prejudice against the Armed Forces than in an apparent, necessary or even logical, expectable development.

The little republic of Switzerland stands out as a shining example of democratic traditions, of love, organization, and maintenance of peace. Yet, when the country in 1941 felt that its borders were threatened, it speedily mobilized, including auxiliary services, 900,000—out of a total population of 4,300,000. The Swiss' pride in their centuries-old peace record is matched only by their pride in their army.

In Lionel Davidson's article, *Switzerland's Citizen Army** he sums up the attitude of the average citizen:

In Switzerland, the advent of military service is looked upon not as a necessary evil to be grumbled about and tolerated, but as an initiation into the larger, social world of adult camaraderie.

The wearing of his country's uniform is not associated with thoughts of aggression. It makes him feel that by induction he fully joined the community of a nation, whose free men were among the first to break the rigid bond of feudalism and to unite voluntarily for their mutual benefit.

American culture—looking back at a history, similar in many respects—should be able to arrive at a similar harmony by a systematic exploration and application of the psychological problems involved.

* April 1948 issue of THE GEOGRAPHIC MAGAZINE.

FIRE SUPPORT FOR AMPHIBIOUS OPERATIONS

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THE mission of a United States infantry division is "to close with the enemy by fire and maneuver (in order) to capture or destroy him; or to repel his assault by fire and close combat." In order to fulfill this mission, infantry divisions have in the past and probably will in the future be called upon to assault a hostile shore—to engage in an amphibious operation. It is generally recognized that a division must be reinforced with logistical and fire support means if the assault is to have a reasonable chance for success.

The logistical support element which reinforces a division during the initial assault is the shore party. The organization and functions of the shore party were discussed at some length in the October 1952 issue of the *MILITARY REVIEW* in an article entitled "The Heart of a Shore Party."

It is the purpose of this article to discuss the fire support means which are available to support an infantry division in an amphibious assault. These are:

1. Naval gunfire.
2. Amphibious tanks.
3. Artillery.
4. Air.

Naval Gunfire Support

Naval gunfire support is fire delivered from ships' batteries in support of troop operations. Naval gunfire is the base of fire on which the attacker relies, to a large extent, to overbalance the fire pow-

er of the defender. Naval gunfire has certain capabilities and limitations which influence its supporting operations.

Mobility is perhaps the most striking advantage of naval gunfire support. Within certain limitations ships can provide enfilade and flanking fires in almost any situation and, at the same time exploit the most favorable range of the weapon being used.

The necessity for *observation* somewhat limits the use of naval gunfire support. Although ships can, as a technical capability, deliver accurate unobserved fire, fire delivered in close support of troops requires observed adjustment. This observation can be furnished from the ship itself, from an offshore observation point, from the air, or from the ground.

The *rate of fire* of naval gunfire constitutes both an advantageous and a limiting characteristic. The advantage lies in the high sustained rate of fire resulting from power loaded guns; the limitation lies in the fact that this high rate of fire may exhaust the available supply of ammunition in a very short time. This limitation is emphasized when we consider that ships must retain sufficient reserve ammunition to repel air and surface attacks at all times.

High muzzle velocity and its resulting flat trajectory are a characteristic of naval gunfire support. This characteristic permits maximum penetrative and destructive power when employed against

targets which have an appreciable vertical surface or are located on a positive slope. However, the availability of reduced charges and the ability to change line of fire by maneuvering the ship, enable these guns to reach a majority of targets.

The *pattern sizes* of ships' batteries are smaller in deflection and larger in range than comparable calibers of field artillery.

Range inland is somewhat of a limitation, since the area to be reached cannot exceed the range of the ships' batteries from an offshore location. Available locations may be limited by reefs, shoal water, and other hydrographic conditions.

Continuity of fire is susceptible to interruption by air, surface, and sub-surface attack and is reduced in effectiveness by conditions of poor visibility and weather.

Matériel available includes a wide variety of weapons and ammunition. Calibers available for fire support range from the 20-mm to the 16-inch gun. Weapons include guns, rocket launchers, and guided missiles.

Communications between ship and observer is dependent almost entirely on radio. This affects the continuity and rapid delivery of naval gunfire support in the same manner that dependence on a single communication means would affect the efficiency of fire support in other operations.

A typical fire support group assigned

An infantry division in an amphibious assault does not have its usual artillery support during the assault, therefore, the necessary fire support must come from naval gunfire, amphibious tanks, and aircraft

to support an infantry division may include one battleship, three cruisers, and nine destroyers. This group would provide a battleship for general support of the division, one cruiser for general support of each infantry regiment, and one destroyer for direct support of each infan-

try battalion. When we consider that a battleship may have nine 16-inch and twenty 5-inch guns, that a heavy cruiser may have nine 8-inch and twelve 5-inch guns, and that a destroyer may have six 5-inch and six 3-inch guns, we can realize the tremendous fire power that is available to the division and its subordinate units—180 guns of 3-inch caliber or better.

Since this fire power is not organic to the division, some means must be provided to control it. Shore fire control parties (SFCP) are included in the Marine Corps air-naval gunfire liaison company (ANG-LICO) which may be attached to a division engaged in amphibious operations. This company provides a SFCP for each infantry battalion, a naval gunfire liaison team for each regiment, and a naval gunfire team for the division headquarters. In addition to these groups, each division requires:

A division naval gunfire officer (artillery officer, or Marine officer from ANGLICO).

An assistant division naval gunfire officer (Navy).

It is desirable also to have a naval gunfire liaison officer (Navy officer from the fire support group).

A Comparison

Let us compare this typical organization for and control of naval gunfire sup-

port with the normal organization employed for the control of artillery support.

Observation and Adjustment

With respect to observation and adjustment of fire:

Artillery furnishes one forward ob-

server party for each rifle company, one artillery liaison officer to each battalion, and command liaison at regimental headquarters.

The ANGLICO SFCP provides one spotter (forward observer) team for each infantry battalion, one naval gunfire liaison team to each battalion, and a naval gunfire liaison team at the regimental headquarters. Air observation is available for both types of support.

The artillery furnishes more control elements than the ANGLICO. Although artillery establishes command liaison, the regimental commander does not command the fire support means of either artillery or naval gunfire.

Available Fire Support

With respect to the fire support available:

Each regiment normally has one light artillery battalion in direct support, with one or more battalions available to the division for general support or reinforcing missions.

Each *battalion* in the regiment has a destroyer in direct support and the regiment has a heavy cruiser in general support.

A battleship is in general support of the division and is available to the regiment if appropriate targets are encountered.

The typical naval gunfire support organization provides more fire support than the normal artillery organization.

There are very apparent similarities in the organization for naval gunfire support and for artillery support. However, one important difference in organization exists above the regimental level—artil-

lery is organic to the division (and higher units) but naval gunfire means are never under the *command* of an army unit.

Amphibious Tanks

The second fire support means available to reinforce or support an infantry division in an amphibious assault is the amphibious tank—the landing vehicle, tracked (armored) (LVT(A)). The LVT(A) is a lightly armored vehicle designed to operate both on land and on water. It mounts a light howitzer and three .30 caliber machine guns. Based on the requirements for and the availability of amphibious tank units, one amphibious tank battalion is usually attached to each assault division.

The first mission of the amphibious tanks is to form the leading wave of, or furnish flank protection for, the assault troops. They place howitzer and machine-gun fire on the beach area while moving toward the beach and later move forward with the assault troops—employing tank-infantry tactics—to secure initial beach-head objectives. The LVT(A)s are capable of performing other support missions but they were primarily designed for this first mission.

Organization

Each of the four amphibious tank companies of the battalion has sixteen LVT(A)s, each mounting a light howitzer. Amphibious tank units, after landing, can furnish indirect as well as direct fire support. These two missions may be combined within one company—with one or more platoons operating as tanks while the remainder of the company operates as artillery. If the LVT(A)s are to be used in an artillery role—after the arrival of direct support artillery in the beach area—maximum co-ordination may be obtained by attaching amphibious tank companies to direct support artillery battalions.

Lieutenant Colonel Charles L. McNeill served with, and later commanded, the 753d Tank Battalion in the Mediterranean and European theaters during World War II. After the war, he left the service, but was recalled to active duty in 1950. From 1950 to 1951, he attended the Command and General Staff College. He is presently serving as an instructor at that College.

What organization for combat makes the most of these capabilities of the amphibious tank battalion? Two amphibious tank companies are normally attached to or placed in support of each assault regiment in order to provide one company for each assault battalion. These companies will support the infantry by direct fire until conditions ashore warrant their employment in an artillery role. At this time the companies may be returned to the control of the amphibious tank battalion commander, or the tank companies may be attached to direct support artillery battalions. The battalion, less detachments, may be attached to the division artillery so that the artillery commander may supervise operations of the battalion and ensure the co-ordination of its fires with other supporting fires after the amphibious tank battalion assumes an artillery role. This attachment also ensures that necessary survey and wire communication facilities are made available to the battalion.

In making use of the capabilities of the amphibious tank battalion, commanders at all echelons must bear in mind the limitations of the fighting vehicle with which the battalion is armed. The design of the LVT(A) for both land and water operations results in limitations on both types of operations—it does not have the speed, maneuverability, and seaworthiness of regular landing craft, nor does it have the durability, speed, cross-country mobility, armor protection, and armament of a land tank. Plans for their employment should be made only after a consideration of their limitations; emphasis must be placed on providing for their early relief from tank-type operations by land tanks.

Artillery

The third fire support means available to the division is artillery. Artillery is, of course, a normal means of fire support within the division, however, special prob-

lems arise with respect to its early employment ashore. These problems cause the employment of artillery in an amphibious operation to differ from its usual employment in the following features:

Artillery normally does not enter into action in an amphibious operation until after the infantry attack is under way and does not participate in preliminary preparation.

The desirable amount of artillery may not participate in initial phases of the operation because of unavailability of suitable shipping.

Initial position areas may be restricted in size and are usually much closer to the front lines than they normally would be.

The dispersion of units upon landing may reduce the ability to mass fires.

The reduction of transportation and personnel required by shipping space limits movement, ammunition supply, and communications.

In addition to the problems concerning employment, the commander is faced with the problem of getting the artillery to the beach at the appropriate time. The artillery battalions must be loaded so as to be available for landing (and employment) as soon as the tactical situation will permit. It is desirable to land the artillery directly from landing ships onto the beaches, but this usually does not permit the artillery, particularly light artillery, to land early enough in the action. Therefore, landing craft, landing vehicles, and DUKWs are often used to carry the light artillery ashore. When LVTs or DUKWs are used, provision must be made to have the prime movers come ashore as soon as possible to release the LVTs or DUKWs to the shore party. It is impracticable to plan a definite time for landing artillery because of such variables as availability of position areas, need for artillery ashore, condition of beach entrances and exists, and ability of the shore party to assist the landing. There-

fore, artillery should be prepared to land when called for by the appropriate commander.

The organization for combat of the artillery is dependent upon the scheme of maneuver and the landing plan. As in any operation, command should be decentralized only to the extent which is necessary to effect maximum support. In an amphibious operation, however, the necessity for attachment must be balanced against the time required to establish centralized control.

Air Support

The last but certainly not the least means of fire support available to the division commander in an amphibious operation is air. This subject was covered in detail in an article entitled "Close Air Support in Amphibious Operations" which appeared in the August 1953 issue of the *MILITARY REVIEW*; therefore, a brief summary will suffice here. Naval air support procedures normally are used during the assault phase of amphibious operations. The system provides for control personnel (TACP) at each echelon of command from the battalion up and for a large percentage of available aircraft on air alert. Under this system the TACP at battalion level (and higher) sends re-

quests for air strikes via a tactical air request net direct to the agency (TADC) having aircraft available for support, intermediate TACPs monitor the request net and indicate approval by remaining silent, then the TADC allots the necessary aircraft to the requesting TACP for conduct of the strike.

Summary

In our examination of the fire support means available to an infantry division engaged in amphibious operations we have seen that:

1. A large amount of naval gunfire is usually available and that the organization for and control of its fires closely parallels that of the artillery, although the guns are never under the command of the division.

2. Amphibious tanks are available in the early stages of the assault to perform the missions of land tanks and artillery although they are not a satisfactory substitute for either.

3. Artillery performs its normal functions after position areas are available in the beachhead and after it has been landed.

4. Air support is quickly available to front-line units through the use of naval air support procedures.

The Army's research and development program has been the spearhead of our progress and is being carried forward with full vigor in all fields. We want our troops to have in the future, as they do today, the kind of weapons and equipment which, combined with thorough training, excellent leadership, and high morale, can be counted upon to offset any potential enemy's quantitative superiority in manpower. Fire power to offset manpower continue to be our goal.

Secretary of the Army Robert T. Stevens

AIR WEATHER SERVICE

ONE of the most important components of the Military Air Transport Service (MATS) is the USAF Air Weather Service (AWS). AWS is a global meteorological service which provides weather observations and forecasts and climatological information to all units of the United States Army and Air Force throughout the world.

In keeping a weather watch around the world, AWS operates 4 weather centrals, 8 forecasting centers, 238 forecasting units, 206 observing units, and 65 upper-air units in 26 countries of the world. AWS is comprised of 2 wings, 8 groups, 20 ground weather squadrons, and 6 aerial reconnaissance squadrons.

Weather forecasting requires great masses of accurate and timely data. Faced with the mission of providing weather support on a global scale, AWS has as its first basic task the world-wide collection of weather observations. Wherever possible, this data is gathered by strategically located ground weather stations. One of these stations is located on a floating ice island in the Arctic Basin and three others are robot stations which observe and transmit weather data entirely automatically.

The need for weather data is no less urgent from areas where it is impractical or impossible to operate manned or automatic ground stations, such as over vast tracts of ocean or desolate terrain. Weather reconnaissance squadrons, flying predetermined weather tracks from Guam, Japan, Bermuda, Hawaii, California, and Alaska, collect and transmit weather ob-

servations at fixed locations at about every one hundred miles along their routes.

The greatest threat to life and property in the Atlantic area is the hurricane; in the Pacific area the same is true of the typhoon. In an effort to minimize these weather threats, the reconnaissance squadrons on Guam and Bermuda respectively, fly into each typhoon and hurricane "eye" in order to collect and send back weather observations. Evaluating the force of each violent storm and estimating its path and speed makes possible advance warnings to ships, aircraft, installations, and populations in the path of the cyclonic winds.

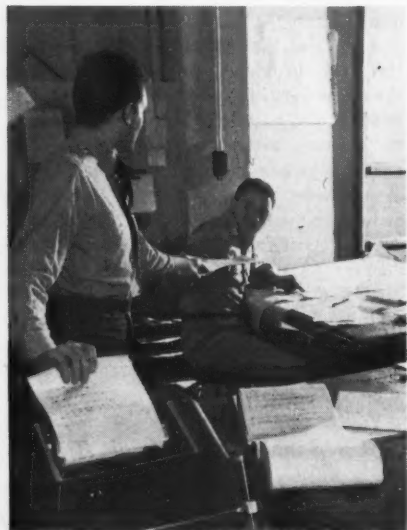
As new and improved aircraft and other military weapons move from the drawing board to the assembly line, the greater speeds and higher altitudes to be achieved place a need for more accurate knowledge of upper-air conditions, such as wind speed and direction. Mapping of the jet stream and the forecasting of contrail formations and clear-air turbulence are only three of the real problems which face the Air Weather Service. If Air Force and Army needs are to be met, AWS must find realistic answers to these and other problems.

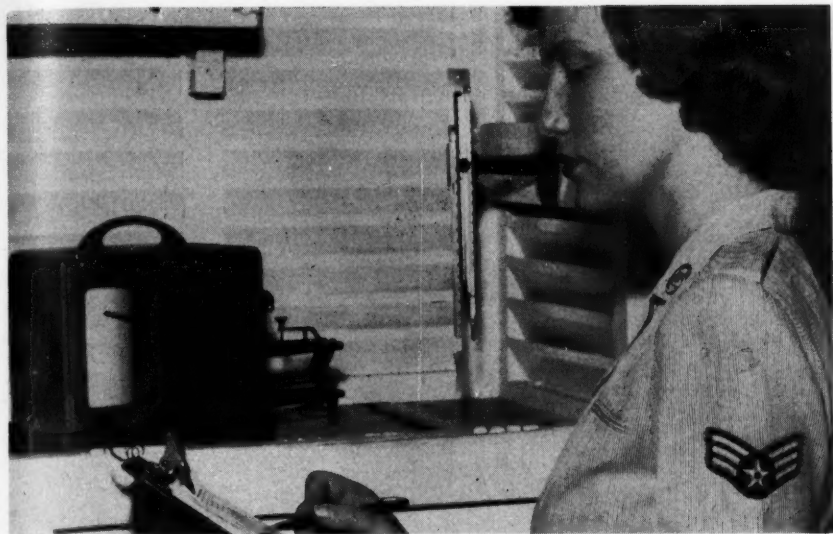
The weather information collected and disseminated by AWS is transmitted around the world by its sister MATS service, the Airways and Air Communications Service (AACS). The work of these two MATS organizations is closely entwined to provide dependable and rapid weather information for all operational and planning uses of our military forces throughout the world.

The Air Weather Service, through its world-wide network of stations, provides full weather support for all air routes, terminals, and geographic locations within the operational areas of the Air Force and Army.



Weather forecasting requires great masses of accurate and timely data. Above, weathermen busy preparing surface climatic changes on Northern Hemisphere charts. Below left, weather data arriving for analysis and evaluation via teletype. Below right, a WAF labeling contour lines on a transparent pressure map.—Department of Defense photos.



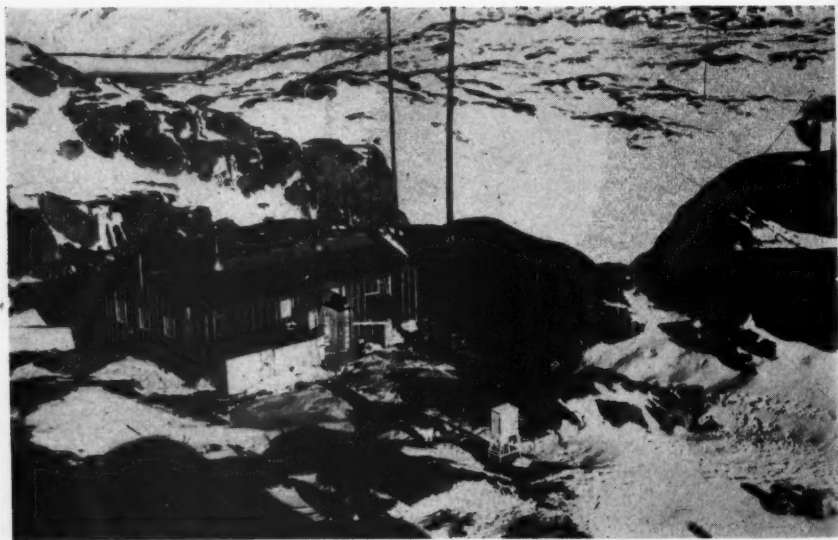


The fury and calms of atmospheric conditions are compiled and charted on complex maps in the symbols of the weather "trade." Above, a WAF taking readings from a barograph—an automatic recording barometer. Below, weather information, received in code, being translated and transposed in symbols on a weather map.—Department of Defense photos.





Basic weather data and local forecasts are culled by small weather outposts and flying reconnaissance squadrons. Above, a *B-29*, used as a flying laboratory, completing its routine "tracking" of a hurricane near Bermuda. Below, one of the important far-flung weather outposts—this station is located in Greenland.—Department of Defense photos.



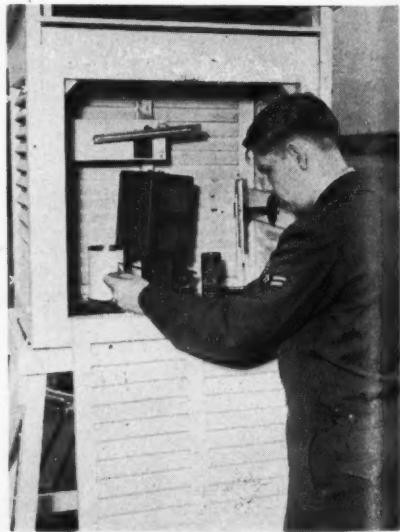


The information concerning the weather status of the continental limits of the United States is transmitted by wire and air waves via facsimile machines to all the air bases in the nation. Above, weather personnel sending out a weather map on the facsimile machine. Below, a pilot receiving a weather briefing.—Department of Defense photos.





The Air Weather Service records, through its numerous instruments and facilities, the unpredictable temperament of "mother nature." Above, an airman collecting weather data in Alaska. Below left, weathermen recording wind direction and velocity. Below right, a weatherman checking local data at a small station.—Department of Defense photos.



A Plan for Army Reorganization

Mr. Karl R. Bendetsen,
Former Under Secretary, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE organization of the Army is an important, if controversial, subject. It is controversial because it is important—not important because it is controversial. For diverse reasons borne of varying motives it is a subject that is seldom treated objectively by many of those who know the most about it—those who serve in it.

It is difficult to disassociate the problem of organization of the defense establishment as a whole from that of the Army establishment. However, I shall try to distinguish between the two and devote my remarks to the Army establishment exclusively.

The solution to the problem of how the Department of Defense should organize for strategic direction, operation, and control of forces in the field, and for conduct of combat operations can be separated from the manner in which a Service Department should organize to ensure proper generation and development of its military forces, including logistical arrangements necessary for intelligent procurement and distribution of the means to support such forces.

Thus, I wish to lay emphasis on the existence of two major problem areas which require differing organizational and procedural treatment. The first relates to the manner in which the Department of Defense organizes both at home and abroad for the strategic direction, employment, administration, and operational control of such military forces, once such forces have been developed and deployed. The second relates to the logistic responsibility (using the term "logistics" in its broadest sense) of the Army as a Service Department—the creation, development and support of military forces. It is the second aspect at which this article is primarily aimed. But first, let us devote a few more moments to both aspects.

The Current Situation

As to the second of these two considerations, it seems to me that even during World War II we did not find the most effective solution within our reach. This problem has long antedated the establishment of the Department of Defense—although it has been accentuated since its creation. The first of these two problems has arisen in new form since the adoption of the National Security Act and its amendments.

In my view, we have hardly come to grips with this problem at all. We have not yet solved the problems of how best to organize an overseas unified command.

There are many gates to heaven, hence, many ways of solving the problems connected with Army reorganization, and all men will not be in accord with any single solution. Can we afford to await the millennium?

The solution to the problem so apparently—although not actually—simple as how to establish a fully unified communications zone within an oversea command has not yet been found—or at any rate has not been placed in effect. Beyond this—if a general war were to be forced upon us and it touched the homeland—we have not yet solved the problem of how best to establish a unified command or commands for the employment of military forces in the defense of the Continental United States. The National Security Act contemplated that the Joint Chiefs of Staff are to establish unified commands in strategic areas. While this has been generally accomplished, the means for the administration of such commands are inadequate. The lines of authority, control, administration, and review between the Pentagon and such unified commands as now exist are unclear and diffused.

For given functions, points of authority and responsibility, at the Pentagon level, vary between commands. In some cases no agency has clear authority and therefore no consequent responsibility. I trust that the guidance which must now emanate from the Department of Defense, in order that the President's Reorganization Plan Number 6 may be successfully carried out,

Mr. Karl R. Bendetsen graduated from Stanford University in 1929. From 1940 to 1946, he was on active military service. In 1941, he authored and processed through Congress the Soldier and Sailor Civil Relief Act; established and organized the Prisoner of War Information Bureau; one of four officers assigned to establish the Provost Marshal General's Department, the Army Military Police Corps, and the School of Military Government. In 1942, he directed the evacuation of Japanese from the West Coast. In 1944, he served as United States Chief of Civil Affairs for Northwest Europe, and later became Deputy Chief of Staff, United States Communications Zone, Normandy. In 1948, he was a consultant and special assistant to the Secretary of Defense, and subsequently became Under Secretary of the Army.

will do much to clarify these fuzzy arrangements.

Logistical Mission Organization

Let us return to the principal subject at hand—the logistical mission of the Department of the Army in its broadest sense, and the organization of the Department and its field agencies for the purpose of discharging this mission of generating military forces, their supplies and equipment.

The Secretary of the Army

Let us first look at the responsibilities of the Secretary of the Army for the performance by the Army of its broad logistical mission, and to the means at his disposal for discharging this mission and for exercising command or management over these means. Under the President and the Secretary of Defense, the Secretary of the Army is by law head of the Army establishment. He is responsible for, and has the authority necessary to conduct, all of its affairs; including, but not limited to those necessary or appropriate "for the training, operations, administration, logistical support; for the maintenance, welfare, preparedness and effectiveness of the Army, including research and development." This delineation of authority is contained in Section 101(a) of the Army Organization Act of 1950.

If we view the Department of the Army as that element of the Army establishment at the seat of the Government, it is clear that the Department, itself, should comprise those elements which are requisite in the general headquarters, or home office, of any multifunctional and geographically-dispersed organization for its management—or as is customary to the military, for its command. These elements must exist but this condition is not enough. The underlying structure which must be managed, or commanded by the home office, must be suitably organized.

The greatest weakness in the Army establishment, if any single weakness can be so described, is in the organization of its underlying structure. In my opinion, no amount of rearrangement in the home office can possibly overcome this weakness. Until it is corrected, no Secretary of the Army or Chief of Staff can manage or command this vast and expensive establishment with optimum effectiveness and economy. This proposal, although not exclusively, is *primarily* aimed at the organization of the underlying structure over which the Department presides.

Admittedly it is a proposal for radical change in the structure. I believe it is an essential first step. Organization must be built from the bottom up.

World War II Reorganization

It is in this principal respect—the failure to reorganize from the bottom—that the World War II organization had its main weakness. It was primarily a reorganization of the home office from the top down—but not very far down. Yet, it was not the condition of the home office alone which required adjustment.

I have heard it said that the burden of proof is on the advocates of change. In this case, I find myself in strong disagreement. The evidence is clear that change is long overdue in the Army's own basic organizational structure. In two world wars it became necessary to make violent changes in the midst of a great national effort. In neither case was the existing structure suited to the strain. In World War II we established Army Service Forces to deal with the logistical mission of the War Department. This, in fact, made little real change in the underlying structure; an intermediate command echelon between the Secretary of War (including his general and other staff) and the operating elements in the field was added which was charged with the mobilization of men, facilities and maté-

riel. Alongside this new, intermediate echelon, Army Ground Forces was interposed between the Department and its field agencies to deal with the determination of military requirements and the training of units.

Minor Improvement Only

These steps attempted to treat symptoms rather than basic deficiencies inherent in the fragmented underlying structure. Even under the impetus of war we were unable finally to decide how to organize this underlying structure. It was never fully decided, for example, whether to decentralize the general responsibility for managing or commanding all activities within given geographical areas to administrative commands. Once the war was over and we had so effectively succeeded in destroying the mammoth military resources we had so painfully gathered, it was not long before the wartime improvisations were abandoned, and we once again reverted to our prewar structure. True, there have been some changes for the better; but these are of minor significance. We find ourselves today an organization similar to that which proved itself inadequate to deal with the demands of World War II—an organization which, while meeting the heavy demands of the Korean conflict and, with difficulty, of the present twilight mobilization, has done this with the throttle pressed down full to the floor board. If a heavier call were made, I fear the existing engine could not cope with a heavier load.

Fragmentation the Rule

The condition of the underlying structure, in my view, is highly fragmented. To deal with buying, merchandising, warehousing, distribution, and research and development, there are seven major services—largely autonomous. Each of these functions is repeatedly performed by each

of these major services. Within its basic domestic establishment, the Army does not have a single warehouseman—it has seven warehousemen, or more accurately, seven warehouse corporations. The seven major services; namely, Ordnance, Signal, Quartermaster, Engineer, Chemical, Transportation, and Medical, are each virtually self-contained. Each has its own personnel system, its own training establishment, housekeepers, and so forth. They are known as Technical Services and their respective headquarters are regarded (and I think erroneously) as an integral part of the home office. In fact, they are not. They are commands in every sense of the word and each embraces every command, management and administrative function found in any large organizational entity. Each has a powerful tendency toward expanding self-sufficiency and away from integration. This is all understandable enough because it exemplifies the less desirable but more common of human attributes—empire building in the wrong direction. Each is autonomous to a considerable degree, yet each carries out similar functions for one establishment—the Army. Sometimes two technical services buy the same end item from one producer—yet their business methods vary.

No Functional Pattern

It is difficult to identify any consistent functional pattern in this arrangement. We seem to have organized our technical services along professional lines. We have, as a matter of fact, grouped our mechanical engineers in one organization, our electrical engineers in another organization, our chemical engineers in another, and our civil engineers in still another. One might, for example, describe Ordnance as a grouping of mechanical engineers; whereas the Corps of Engineers is a grouping of civil engineers, the Signal Corps is a grouping of electrical engineers, and so on.

Research and Development

Another example wherein it is difficult to identify any consistent functional pattern is in the field of research and development. Today this function should be more closely enmeshed into the identification of major problem areas and their solutions. It cannot be performed in seven autonomous “departments”—seven separate technical services.

The relationship of research and development to strategic planning and to the budgetary process is, or should be, intimate and continuous. What we order today or next year for delivery and use, 2, 3 or 5 years hence should be governed by conclusions which can only be soundly reached if this relationship is close and continuous. The “new look” at strategy which the Joint Chiefs of Staff have been directed to take, must rely in major degree upon this relationship. Conversely, priority of effort, areas of emphasis in the research and development function, should be governed by the same affinity. Today's organization does not adequately serve this vital requirement.

I caused a study to be made of this. This study proposed a plan for a revised Research and Development organization, under date of 20 December 1951. It is available in the Departmental files. The organizational changes which were placed in effect as a result of this study do not, in my opinion, meet the deficiencies noted by it. These operations are carried out within each technical service by each of the several professional groups I have mentioned. Unless we are to assume that this important function should be managed in such a way as to bring forth only a series of projects whose interrelationship is difficult to establish and more difficult to co-ordinate—despite the manifest value of each project standing alone—then change is needed. It is not enough, as I see it, to adopt a list of unrelated projects calling for improvement, let us say,

in motor vehicles, in rounds of ammunition, in communications facilities, and the like. Our objective is to go beyond improvement alone by developing and increasing our capacities to deal with given military problems employing combined elements.

Present Organization

As we are now organized, it seems to me that we face a perplexing example, particularly in this field of fragmentation and of avoidable duplication. Despite the professional groupings which characterize our technical service commands, we have not avoided duplication—it has been accentuated. For example, Ordnance—a professional grouping of mechanical engineers—has entered the electronics field to a major degree.

On the other hand, the Corps of Engineers—primarily a professional grouping of civil engineers—is heavily engaged in dealing with automotive, vehicular and electronics problems. Our civil engineers are thus responsible for the development, design and procurement of earth-moving equipment which is ordinarily built by mechanical engineers. I have heard it argued that the justification for assigning to the Corps of Engineers the functions of developing, designing and procuring earth-moving automotive equipment rests on the fact that the Corps of Engineers is the primary user of such equipment. I cannot quarrel with this argument.

But, if this contention is sound, and if then, accordingly, it should be the general rule in the Army establishment, the exception overwhelmingly outweighs the rule. For example, Ordnance has the responsibility for design, development, improvement and procurement of guns, tanks, ammunition, and tactical vehicles, although it is *not* the user. Our combat and field forces are the users. What has been said of Ordnance is largely true of Quartermaster and Chemical Warfare Service. In the hands of these three tech-

nical services has been placed the responsibility for development, design, improvement, and procurement of the great preponderance of all military end items in terms of numbers, weight and cost. I do not propose that our combat and field forces do the buying and wholesale distribution. But we must bring the user into the position of having a stronger, integrated, voice in, and clearer authority over, the design and development of military equipment required by those forces—that we must follow the rule in all logic rather than the exception, as we do today.

To return for the moment, however, to the absence of a functional pattern among the professional groupings which characterize our basic organization, we find our civil engineers drawn into the electronics field to a substantial degree. They have responsibility for battlefield illumination, for example, infrared, and thus are drawn into such activities. Whereas Ordnance has the responsibility for development and procurement of mines, the Corps of Engineers carries the responsibility for mine-laying equipment. Although the Transporting Corps has no responsibility for design, development, improvement, and the like, of land transportation equipment other than rail, it recently was given responsibility for the development, procurement, distribution and maintenance of Army aircraft.

Centralized Decentralization

As will be more fully discussed with relation to the organization of the home office in another part of this article, the condition just described inevitably results in forcing into the home office the necessity for attempting to form a bridge over this fragmentation. Although no major problem in research and development falls within the purview of any one of our operating agencies or professional groupings, yet there is no adequate agency in any headquarters, least of all, the home

office, as matters stand today, which is able to deal with the whole problem. It is because of this hard fact that efforts to decentralize operations while centralizing control are so consistently rebuffed.

Stated another way: the only existing agency in a position to undertake the co-ordinated management of Army efforts to develop its mine-laying capabilities, for example, which are now diffused between Ordnance and Engineers, is the G4 division of the General Staff. Such functions were never intended to be performed by the General Staff. Consequently, G4 has long ceased to be a General Staff Division and is in reality an understaffed Headquarters—Army Service Forces—shorn of the requisite command facilities which the Army Service Forces possessed.

Divided Responsibility

It has long been contended that we must adhere to the technical service command concept as the controlling influence over the shape of our underlying structure. This argument is to the effect that there must be a point of fixed responsibility placed, for example, on the Chief of Ordnance in order to develop, design, procure, and in certain cases, assemble, a tank, an artillery piece, or other items. Otherwise—it is argued—it would be impossible to fix responsibility if the end item did not measure up to the hard demands of battle. In fact, the responsibility is divided. There is no fixed point of accountability below the top. The user is denied the compelling voice which in all logic should be accorded to him. What happens is that in a good many instances, but not in all, the user's representative writes down on a piece of paper a set of military characteristics which the user feels he ought to have in a given item without knowing whether it is feasible or not and without any real idea of the cost. The technical service then ultimately produces a prototype with which the user has had little to do in the

course of development until it is ready for field test.

This cycle is expensive, time-consuming, and divisive. I am not advancing the suggestion that the user do the procuring, manufacturing, warehousing, or wholesale distribution. I am not suggesting that the user should undertake product correction or improvement which would not significantly change the military characteristics of a given item. What I am saying is that the user's representative must be given the means, the resources and the authority to determine his requirements; and that once a feasible prototype has been produced, as an element of a weapons *system*, someone else can then procure, manufacture and distribute them. Under such conditions, the responsibility for design would become clear. On the other hand, the responsibility for supply also would become clearer.

Semi-Autonomous Armies

Let us consider some further examples of fragmentation existing in the underlying structure. The six so-called continental Army commands are, in fact, administrative commands performing similar functions in given geographical areas. These commands are semi-autonomous in nature, and are accorded the freedom of action and prerogative which by tradition and doctrine the Army has long accorded a combat command, such as a field army. This condition persists, notwithstanding the fact that among the principal functions of our six continental Army commands and the military District of Washington, are induction, classification, training and separation of personnel; as well as the handling of reserve components. Thus, whereas the Department promulgates policies which are presumably consistent and clear, their execution varies among the six Army commands. I can think of no clearer requirement than that in dealing with personnel wherein the exe-

ution of policy must be uniform. I can think of no instance in which there is less reason for autonomy, and, as a matter of fact, less reason for the existence of a number of semi-autonomous commands for the purpose of dealing with these functions of personnel administration.

Here, again, our continued efforts to decentralize are rebuffed. The variations existing among the six Army commands in the execution of given policies, inevitably force operational questions to the Department level. The G1 office of the General Staff finds itself in a situation analogous to that of the G4 office. It is, in fact, an administrative agency, which undertakes to direct the personnel operations of the Department without means adequate to the task. It presides over a fragmented structure and there is no agency in existence to provide objective monitorship, objective review and analysis of our personnel administration, as was intended by the original concept of a General Staff. It is in the impossible situation of being required to engage in self-review, of being a staff agency in theory and an ineffectively organized bureau or directorate in fact.

One of the main causes of embarrassment to the Army Establishment—in times when it is so important that we gain, win and hold public confidence—is in the field of personnel administration. Yet the handling of induction, separation, classification and training is fragmented and varied among our six commands. From hard experience I know this to be the fact.

Geographical and Technical

It should be noted in passing that current Army procedures assign to the six Army commanders, the task of allotting all funds required by each installation in their respective geographical areas for power, light, water, repairs and other utilities. However, within these respective geographical areas, are separate in-

stallations and various major activities under the command of the several technical service commanders. The Army commanders have no responsibility whatever for the performance by these technical service installations of the missions assigned to them by their respective technical service commanders. Yet, army commanders apportion the funds and personnel spaces required by them for their operations and for their utilities, repairs, and the like, with no responsibility for results. This diffuses authority and responsibility.

A Web of Confusion

For example, the Ordnance Proving Ground at Aberdeen, Maryland, is a Class II installation under the command of the Chief of Ordnance. It lies within the geographical boundaries of the Second Army. The Commander of the Aberdeen Proving Ground is responsible to Chief of Ordnance for the performance of his mission and the conduct of all activities at his station. Yet, he must go to the Commanding General, Second Army, in order to justify an important segment of the funds he needs to perform his mission and to do his job—despite the fact that the Commanding General, Second Army, has no responsibility whatever for the activities entrusted to the Commander of the Aberdeen Proving Ground by the Chief of Ordnance.

Aside from the substantive fractionalization of responsibility and authority, which to me defies sound command or sound management, the accounting, book-keeping, reporting and fiscal complications this condition creates in the Army establishment are enormous. They involve unnecessary costs, unnecessary paperwork and unnecessary personnel. The Commanding General at Aberdeen accounts to the Chief of Ordnance for some 40 percent of the money he spends, and to the Commanding General, Second Army, for

most, but not all, of the balance. A charting of these funding channels would resemble a spider web. Thus, neither the Chief of Ordnance nor the Commanding General, Second Army, are in a position at any given time to know what it costs to run Aberdeen Proving Ground. In order for the Department of the Army to find the answer to this question, administrative tasks which have no business in the Pentagon are forced to the top of the pyramid and into the home office.

A Pentagon Field Office

Theoretically at least, the establishment of Army Field Forces was an act motivated by a desire to decentralize. To it has been assigned certain specific responsibilities, but upon close examination it is quite evident that this organization lacks either the authority or the means to carry them out. It is, in fact, a field echelon of the G3 office of the Army General Staff. The Army Field Forces is responsible for training, but it commands no training agency. The training of technical service personnel in units to support the combat forces is wholly beyond its resources. In frank recognition, Army Field Forces, therefore, redelegated this function to the heads of the technical services who possess the only instrumentalities and the bulk of the personnel which could together discharge the mission in the first place. Although responsibility for supervision over Army training is assigned to G3 and presumably to Army Field Forces, the technical services are neither under the management control of G3 nor the Army Field Forces. They are under the management control of G4. Army Field Forces commands no Army school, no training installation, and yet it is responsible to G3 for training.

Army Field Forces is presumably responsible for the development of Army forces, yet, in fact, it lacks the bulk of the available scientific personnel and

resources with which to deal effectively with the research and development function which this mission inextricably entails. Forces development is a function which rests primarily on research and development in its true sense. The identification of military problem areas and the formation of specific problems for their solution in terms of research and development actions to meet deficiencies, is presumably one of the stated responsibilities of Army Field Forces.

At least, it is supposed to come forward with specifications for equipment and weapons required by our combat and field forces. Yet it has no developmental facilities. As the so-called user representative, it is remote from the means and resources now commanded by the technical services which can and should be integrated for a co-ordinated assault on new and better system, doctrine and technique to be applied to ground warfare as a whole.

Today these scientific resources are largely aimed at isolated segments—a new or better jeep, a lighter walkie-talkie, magnesium bridging gear, or a different shoe. Everybody is busy spending money in his own bailiwick. The close marriage of the field forces into the design and development of systematized end items to meet specifically identified needs to deal with battle situations in a war to come, into the process of building a given prototype, and into the important and costly process of product correction, is the exception rather than the rule.

I have long urged that Army Field Forces be designated by another name—"The Forces Development Command"—and that it be accorded the authority, resources, and means requisite to the discharge of such a mission.

Service Functions

What has been said of other functions, by way of example, is true of the so-called service functions of the Army es-

establishment. These are fragmented and diffused, and are performed by the seven technical services and by several administrative commands. This, in turn, aggravates the condition in which the home office finds itself. The G4 office, by force of circumstance, again, is required to act as the bridge, or the central switchboard, for the management of these activities. It is a staff agency in theory, an operating directorate in fact, and, in my view, is neither staffed nor equipped for the purpose. It is a deciding and action agency, not a review agency.

In discussions and in analyses of this character, it is the practice traditionally, exhaustively to document each assertion, whether obvious or not. In this article I break with that tradition. Based on rather close observation and a reasonably intimate experience with the subject at hand since 1940, I take the liberty of offering my conclusions for what they are worth. I have over a period of time researched this material carefully. It is all readily available, and, if my conclusions require further support, the material on which it is based exists in copious quantity. To mention but a few sources of basic material, I refer to the Haislip Board Report; the Lutes Report; the findings (not necessarily the conclusions) of the Cresap, McCormick and Paget Report; and the report of the Management Division of the Comptroller of the Army, both preceding and following the findings of the Cresap, McCormick and Paget Report. This material, together with the experiences to which I have been exposed, impels me to the conclusions I present.

I think it is imperative that our underlying operating structure undergo a major reorganization, along functional lines. Only in this way can existing fragmentation be overcome.

One of the most compelling reasons why this step should no longer be deferred, is that the cost of buying the active defense

we are able to obtain with the dollars appropriated is increased by:

1. The fractionalization of the operating structure.

2. The repetitive duplication of functions.

3. The situation under which our principal developmental agencies in the domestic establishment are engaged in a segmented, compartmentalized, piecemeal preoccupation with a better spark plug, a new bed sheet, mess kit, rifle, or what not and the consequent absence of effective, detached objective research of major battlefield problems.

4. The absence of an adequate management center in the home office with which to tie together the using services with the procuring, distributing and developmental services.

5. The difficulties which thus stand in the way of over-all programming and review of progress.

I am convinced that the amount of military resources, the amount of active defense, which we would be able to buy with the dollars made available is significantly less than could be bought if we have the courage to reorganize our establishment.

The Field Establishment

It is with all this in mind that the first of two major reorganizational proposals is here presented. The first will deal with the underlying structure (field establishment) and the second, with the home office (Department of the Army). In developing both the first proposal and the one to follow, I am mindful of the Army Organizational Act of 1950 and of the other basic statutes. With minor exceptions—which need not stand in the way or cause action to be deferred—both proposals could be adopted without the necessity for amending any governing law.

Figure 1 delineates the underlying structure or field establishment over which the Department would preside. The func-

tions which the Department must manage have been grouped into seven major categories. Six of these are designated as commands. The seventh, the Army Audit Agency would retain its present name but would report *directly* to the executive office of the Secretary of the Army—not through the Army staff. These commands are as follows:

1. The Personnel Command.
2. The Combat Command.
3. The Development Command.
4. The Service Command.
5. The Procurement Command.
6. The Special Operational Commands as required.
7. The Army Audit Agency.

Aside from Operational Commands as required, and aside from the Army Audit Agency—the latter is now in the process of converting into a field agency with headquarters at Gravelly Point—I have also given a suggested location for the headquarters of each of these commands. These suggestions are based on close analysis and consideration of the functions entailed in each case. Because this proposal would disestablish the six continental Army commands and would transform Headquarters, Army Field Forces, into a command having stated responsibilities, all existing facilities now used by the six Army commands and by Headquarters, Army Field Forces, would be employed effectively. Thus, the substantial costs which would be entailed in creating additional headquarters and expensive communications facilities, which would be requisite for their operations, would be averted.

The Personnel Command

The Personnel Command would have its headquarters at Fort Meade, Maryland, in the area presently serving as Headquarters, Second Army, where it would be in close touch with the Department. Its

responsibilities would include: manpower procurement, processing and personnel services, induction centers, reception centers, separation centers, replacement centers, training divisions, prisoner of war camps, disciplinary barracks, WAC training centers, and training divisions (for basic, not unit, training).

The Combat Command

The Combat Command would have its headquarters at Fort Sam Houston, Texas, and would have as its principal function the organizational training and readiness of all Army units. The functions of this command would be discharged through four subordinate commands which would be located as follows:

1. Eastern Defense Command with headquarters at Fort McPherson, Georgia.
2. Western Defense Command with headquarters at the Presidio of San Francisco, California.
3. Antiaircraft Command with headquarters at Colorado Springs, Colorado.
4. Army University with headquarters at Carlisle Barracks, Pennsylvania.

Appropriately assigned under these commands would be training stations, schools, defense command installations, Organized Reserve Corps installations, and training centers, Officer Candidate Schools, Reserve Officers' Training Corps Units, and the United States Military Academy.

The Development Command

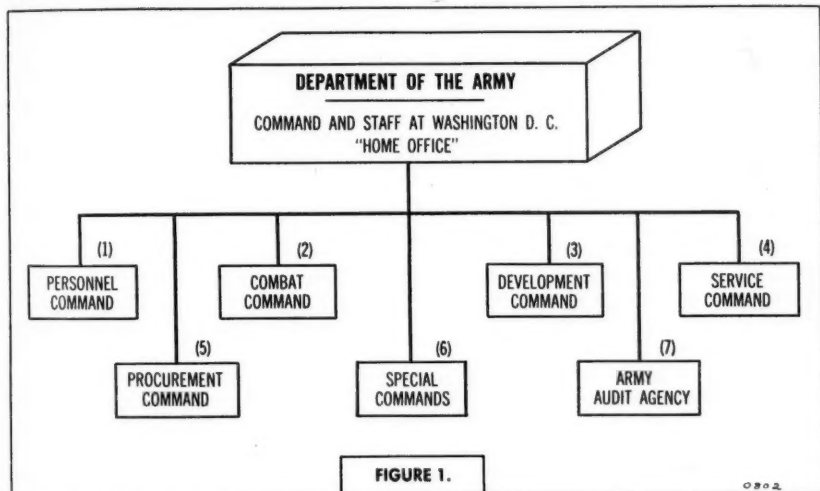
The Development Command would have its headquarters at Fort Monroe, Virginia, presently serving as Headquarters, Army Field Forces. The Development Command would have as its principal functions the development of field forces—that is combat and support forces, new doctrine, weapons and support systems, to include combat research and development centers.

At this point, I think it might be ap-

appropriate to say that in my view, the coining of the phrase "research and development," although well-intentioned, probably created more confusion at one stroke than any other coined phrase in the military lexicon. Research and development now includes everything from a gleam in the eye to a new cotter pin. To me product correction is not research and development. A suitable end item may be satisfactory to the user, but there may be many ways in which it can be improved from

ter services, particularly the Navy, have brought that concept into successful use.

Included in the Development Command would be Army Laboratory Development Boards (such as the Field Force boards, Proving Ground, the Army Security Agency, the Counterintelligence Corps) and Operations Research. Operations research is just a fancy name for finding out what the facts are concerning a given phase of combat operations. The function is analogous to that of the profes-



0802

a production and maintenance standpoint without changing its characteristics in any significant way at all. Ways might be found, for example to lower its cost, or produce it faster.

That is always associated, as it should be, with the procurement and manufacturing process. It is not research and development in the sense we in the Army use the subject or the phrase. If we can separate these thoughts clearly in our minds, it would, I think advance our basic understanding.

Research and development of the Army's capabilities requires combat development centers for that purpose. Our sis-

sional management engineering firms hired by professional business firms to take an objective look at basic facts about their businesses.

For example, for many obvious reasons it becomes important to know what exactly makes a "Kill" on the battlefield. It does no good to kill the same thing—say an enemy tank—several times. We cannot afford it—yet we have done just that. Operations research helps to find out what happens on the battlefield at the points of action. Facts such as these can change weapons systems, save manpower, resources and dollars. What we really want to know is what delivers the payoff so that

we can get rid of unessential equipment with which we are already overburdened.

Another research function which such research and development centers would perform, under the Development Command, would be human resources research. This entails research into two major areas. First, what motivates the enemy? What makes him fight; and how can we get at him and destroy his will, or precondition him so that his will will be less than it was? And second, human resources asks: What about our people? Such research ties into every aspect of operations. For example what about the weight of a pack? How much gear can a man carry?

Every aspect of research is involved in the sound development of field forces—whether in terms of men or of whole integrated military systems—weapons, doctrine, manpower, field support.

The Procurement Command

The Procurement Command would be charged with procurement, production and construction. Construction is just another form of procurement. It is another way of acquiring a building—we can buy it, build it, or lease it. Headquarters would be Chicago, Illinois, in the facilities presently occupied by Headquarters, Fifth Army. There would be procurement and construction subdivisions assigned on a geographical basis where needed. Industrial installations and manufacturing arsenals would be under the Procurement Command.

Product correction would be the responsibility of the Procurement Command—that is, improvement without significant change in military characteristics.

Procurement and construction districts would exercise supervision over the procuring of construction contract services, design, and all the other functions the Corps of Engineers now exercises.

This is not the place to discuss whether civil works should or should not be the responsibility of the Army—it is the re-

sponsibility of the Army today. Under the statutes, the Secretary of the Army and the Chief of Engineers have many responsibilities for civil works.

Those responsibilities would still be supervised by the Chief of Engineers in a staff capacity but he would decentralize operations to the procurement and construction districts.

A word concerning certain aspects of the Development and Procurement Commands relating to end item improvement seems indicated at this point. Close coordination between developer and producer would be encouraged. This proposal would result in eliminating from the so-called research and development budget, funds for product improvement and correction, wherever significant military characteristics are not involved. The Development Command would not be concerned with that, nor would it budget or fund for it. This would be the responsibility of the Procurement Command. On the other hand, the Development Command would carry the basic responsibility for programming, budgeting, funding, conducting of and reporting on all research and development activities. Under these conditions certain of our arsenals would inevitably become multipurpose stations, with their research and development activities under the management or control of the Development Command, and the product correction, improvement, engineering and associated manufacturing activities under the management or command of the Procurement Command.

The Service Command

The Service Command would have headquarters at Governors Island which is presently serving as Headquarters, First Army. Its facilities would include depots, ports, holding and reconsignment points, army hospitals, communications centers, finance center (and the regular finance offices), staging areas, army maintenance

installations, shops and repair facilities, and other supply installations. Its functions would be supply, distribution, and support services.

At multiple-purpose stations, a post commander would be provided by the Service Command, but he would manage post facilities in accordance with the requirements of each major command there represented. His funds would not reach him through the Service Command, but through the command channel governing the activity concerned at a given station. In other words, each tenant would pay the bill for required services measured in accordance with the tenant's mission. This would, of course, not prevent the pooling of resources, which has been the standard excuse given for not doing it. Nor would the fact that there may be (and should be) a single power station, laundry, repair shop, motor pool, or telephone central present any difficulty at all. Each activity would bear a proportion of the cost of operating the common support facilities of each station on a proportional basis. That is what a post staff tries to do now, where there is more than one activity. There would be but one post commander and one post staff. It should be borne in mind that the Service Command would budget and fund only for its own integral needs, and not for the needs of somebody else. It would be the servant, not the master.

A number of the functions now fragmented among several technical services would be conducted by the Service Command. At one time in Army history, some of these functions were performed by a single agency—namely, the Quartermaster Corps. Prior to World War II, The Quartermaster General was the Army's chief warehouseman for common use standard stock items. He was the Army's general depot system manager, and, additionally, he was responsible for port operations which, in fact, are inextricably

associated with the depot system and should not logically be separated therefrom—as is the case today. Furthermore, the Army Transportation Service, both land and sea-borne, was under his direction. Transportation is a link in distribution but it is not distribution itself, it is only one of several elements. Whereas, in times past, The Quartermaster General was also responsible for the operation of fixed maintenance facilities, such as automotive, the Service Command would now be responsible for all of these. Whereas The Quartermaster General was formerly responsible for military construction, it is my view that this is not a function appropriately assignable to the proposed Service Command.

It may be argued that the grouping of the mentioned functions under a Service Command should not now be considered on the ground that under the stress of the mobilization preceding the outbreak of World War II many of these functions were taken away from The Quartermaster General. It was then alleged that he failed to handle them properly. I think there is an answer to that. In the first place, the construction function should not have been in his hands anyway. This task engulfed his organization, but, oddly enough, the Quartermaster had nearly licked the problem when the responsibility was taken from him. The many other logistic responsibilities of the Army were being conducted in an atmosphere of such great fragmentation diffusion and inadequate home office management that the Quartermaster was made the scapegoat for deficiencies which were not of his making. The Quartermaster is today among the most effective of our family of technical services.

Peculiar to Whom?

One further word about the instant proposal which would consolidate the warehousing or depot management and wholesale distribution functions under the

Service Command requires clarification. Associated with the trend which gradually took the role of chief warehouseman out of the hands of The Quartermaster General was the contention that whereas so-called common use standard stock items might safely be warehoused by a single agency, parts and items "peculiar" to a technical service could not safely be so handled for technical reasons. This strikes me as a specious argument. To illustrate my point I would ask the question: "Peculiar to whom?" Virtually all military weapons, supplies and equipment must be handled, stored and distributed on a "retail" basis, at least, by our combat and field forces. If technical advice and assistance is required on how best to store, or package, or ship a given item which may have technical characteristics, such advice and assistance can be made available to the commander of the Service Command, just as such technical advice and assistance is now provided to the commander of a combat force employing combined elements in the field.

The point is that the bulk of our items are in fact peculiar to no technical service. They are required and used by our field combat forces. It is, of course, the infantryman, the tanker and the artilleryman who use, operate and must know how to handle tanks, guns, walkie-talkies, and almost all other equipment. So much for the Service Command.

Special Commands

Special Commands would be established as required. For example, a headquarters command for the Department of the Army would be needed because under this proposal there would be no Military District of Washington.

General Comments

Each of these commands would have responsibility subject to the continuing control of Department of the Army, for

programming, budgeting, funding and reporting. No geographical administrative commands would be interposed between these new commands and their field elements. They would each be required to engage in self-review, but this would not be a culminating step in review. This step would occur at the Pentagon level—which is what the Pentagon ought to be doing rather than operating as it does today. Technical personnel would be assigned to each of these major commands in accordance with need—the major groupings, of course, to be in the Development, Procurement, and Service Commands.

Training

The proposal here outlined might lead to the conclusion that the training function has been fragmented between the Personnel and Combat Commands. The reader must argue that one out for himself—I argued with myself for a good while.

Basic individual training is made the primary responsibility of the Personnel Command. Unit training and advanced training of the individual are the responsibility of the Combat Command, where the developmental aspects of new doctrine should be brought to bear. In other words, the Personnel Command has the preunit phase; the Combat Command has the unit and postunit phase.

To endow each of these principal commands with the necessary technical competence, technical service personnel would be appropriately distributed among them as required, just as they are to field combat forces now.

Determination of Requirements

We have not yet dealt with the home office and the functions of over-all program guidance, review, analysis and decision, which the home office must discharge. At this point; however, it may be desirable to describe the process which would be involved under this proposal for the deter-

mination and computation of requirements. The cycle would be substantially as follows: The Development Command would initially determine matériel and supply requirements; the Service Command would compute, and the Procurement Command would obtain them.

In the case of personnel, the Development Command would determine requirements. On the basis of initial computation—once they had been furnished by the Development Command to each of the other commands—the Personnel Command would receive the computations, review them, and submit them to the Department for review and approval. Once the Personnel Program had been adequately reviewed and approved by the home office, the Personnel Command would procure and distribute in accordance with the approved troop or other manpower bases.

The Home Office

Let us now turn to the home office. The proposal made here would not now involve any major changes in it. Subsequent changes would doubtless be necessary, but these should be based upon conclusions reached as experience is gathered. Organization is dynamic, not static. It must progress and move with changing circumstances. Organization demands boldness, not timidity. At the same time, it must always be deliberate. As stated before, the organization of the home office reverted substantially to the structure which had been in existence prior to World War II, and which had been adopted in the years which immediately succeeded the close of World War I. However, this proposal would change the philosophy of organization of the home office in a substantial sense.

Historical Background

Before coming to the specifics of this proposal, it might be worth while to review some of the pertinent history on how

we obtained the familiar General Staff structure which now exists in the home office, and consider whether it was adopted deliberately or largely by historical accident.

For most of the years between World War I and World War II, as at present, the Army General Staff consisted of a Chief of Staff, a Deputy Chief of Staff, and four general staff divisions, each headed by an Assistant Chief of Staff. For some time prior to World War II, there was a fifth section of the General Staff known as the War Plans Division.

In the rather violent reorganization which occurred in March of 1942, the War Plans Division was dropped, and a fifth section known as the Operations Division was created. This division was really the Washington command post of the Army's world-wide operations. After the disestablishment of Army Service Forces and Army Ground Forces, the Operations Division was dropped. I think inadvisedly—but at any rate, it was dropped. There briefly existed a new sixth section of the General Staff, charged with supervision over research and development. This was a good idea, but it did not stick, unfortunately. It was later merged with the Logistics Division (now G4), and became one of its subordinate segments. Following the subordination of research and development into the Logistics Division, alongside of procurement, supply and distribution, in actuality five divisions of the General Staff still continued to exist because what is now G3 was organized as two separate divisions—Organization and Training, and Plans and Operations.

The AEF of World War I

Later in the fall of 1949—when relatively minor and interim changes were placed in effect, following the rejection by the Army staff, and by the technical services as well as the Chief of Staff, of the Cressap, McCormick and Paget find-

ings and recommendations—we reverted to a 4-division General Staff once again. This form has, with considerable consistency, characterized the pattern adopted following the return of General Pershing to the United States from command of the American Expeditionary Forces (AEF) in World War I. He became Chief of Staff upon his return, and was instrumental in establishing this form.

How did it get there? Between the adoption of the Root Reforms during 1902 and 1903 and until World War I, the Army General Staff bore no resemblance whatever to the pattern which General Pershing espoused. Secretary Elihu Root realized that he presided over a semi-autonomous group of bureaus and administrative commands with no adequate staff available to assist him in providing the general direction, co-ordination, program guidance and review so manifestly needed. He succeeded in obtaining legislation—against bitter opposition—which provided that the senior officer of the Army would be his Chief of Staff, that the Chief of Staff would exercise no command functions but would serve as principal military advisor to the Secretary of War and would preside in the role of a chief staff officer, over the staff of the Secretary of War.

Root, as Secretary, had no staff and he realized he needed one for the law said he was responsible for the over-all command or management of the Army. So he got one. Mr. Root called it a General Staff only because it was to be a staff of general assistants to him—a staff, “generalist” in nature. It was in no sense, as is erroneously supposed, a so-called Prussian-type general staff. It had no relationship to it. There is no basis for that concept whatever.

In the years between 1902 and 1903 and the return of General Pershing from France to become Chief of Staff, the Army General Staff was organized in varying patterns. Otto Nelson’s book, *National*

Security and General Staff, shows the successive stages. For the most part, it consisted of two sections. That was its major pattern. The first of these was located at the Army War College—then known as Fort Humphreys, now as Fort McNair. This division had no administrative duties. Its responsibilities were to think ahead and to formulate war plans to deal with the eventuality that the nation might be forced into armed conflict.

The second of these two divisions was stationed with the Secretary of War in the old State-War-Navy Building, now the Executive Office Building. Its primary responsibility was to furnish the Secretary with professional advice and to assist him in commanding or managing the semi-autonomous bureaus and administrative agencies which characterized the War establishment. It is humorous to note that the nature of the problem of planning ahead was so little understood in the months preceding World War I, that when Secretary of War Newton D. Baker on one occasion casually advised President Wilson that there was, in fact, a group of professional officers at the Army War College developing war plans, President Wilson was horrified and immediately ordered Secretary Baker to get them out of Washington and break up their efforts.

It should also be noted in passing that despite Secretary Root’s incomparable capacities, foresight, and statesmanlike approach, either he failed to perceive how badly fragmented the underlying structure was then, or if he did perceive the difficulty, he must have felt it was more of a reform than even he could accomplish over the resistance of the entrenched bureaus of that day. If that was his reason, my hat is off to him. I must say it would have been nearly as formidable a challenge then, as I am sure it would be now to deal with this long-standing difficulty. The need for reorganization is much more compelling today than it was

in Root's time. The problems then were so comparatively simple that Root's small staff of general assistants were not forced to become overburdened administrators. Let us return to a resumé of how it happened that the War Department first adopted and since has so persistently clung to the 4-division General Staff arrangement. When General Pershing established his headquarters at Chaumont, France, it was organized along the lines then in vogue for an American field army command. He at once ran into some very disquieting problems. He found that co-ordination with his opposite numbers in the French field command was next to impossible. The organization of the headquarters of these two field commands were so sharply differing in nature that lateral co-ordination between them in preparing campaign plans and in the conduct of operations could not be made to work effectively.

He first undertook to convince the French commander that the latter should reorganize his own headquarters to conform to the AEF. Failing this, he directed that a study be made to find an appropriate solution. This was done, and it was recommended to General Pershing—and he approved the recommendation—that his headquarters be reorganized along the lines of the French Army Headquarters, with which he was then dealing. This had a *Chef d'état-major* and four bureaus, namely, *Premier, Deuxième, Troisième, and Quatrième Bureau*. In other words, it had a Chief of Staff and four principal bureaus. With a show of practical American brevity, these four bureaus were described as G1 (namely, General 1), G2, G3, and G4; Personnel, Intelligence, Operations, and Supply—exactly in the manner that the French Field Army had functionalized its headquarters staff into bureaus. The French were also practical. They called them bureaus, which is what they were, and always have been.

War Plans Division

General Pershing made one variation and one change in the form of the organization of the French Army Headquarters which he adopted at Chaumont. Because the planning load incident to projected military operations was so heavy, General Pershing divided the "third bureau" into two sections—Plans and Operations respectively. Thus, at Chaumont there were really five bureaus, or five general staff divisions. In making this variation, General Pershing did so to deal with the special circumstances I have just described. It made good sense to separate the planners from the operators in any case.

The War Plans Division of the War Department General Staff which existed for a time prior to World War II was, in fact, a relative of the Chaumont Plans Division; and it was General Pershing who made the suggestion for its re-establishment in the 1930s.

The Plans and Operations Division of the Army General Staff, which existed for a brief period after World War II, was a more distant cousin, because of the fact that in it plans and operations were combined and the organization (of military units) and training functions were split into a separate division.

A more significant change adopted by General Pershing at Chaumont was the establishment of an adjunct of the office of his Chief of Staff, known as the Co-ordination Section. This was a small but powerful unit. It was, in fact, created by General Pershing to afford him a general management center, a compact general staff, to co-ordinate his five functional bureaus. It also had a statistical unit to provide the commanding general and his chief of staff with control data, with a picture of where the command stood as a whole, and with a comparison of actual progress against plans. This necessary and prudent element which General Persh-

ing added to his headquarters at Chaumont was lost sight of, unfortunately, in later years, and we have seldom since had the benefit of a general staff.

The statistical unit carried on as a vestigial remain in the War Department General Staff between the two world wars.

After World War II and with the creation of three deputy Chiefs of Staff, now called Deputy for Plans and Research, Deputy for Operations and Administration, and the Comptroller, this Co-ordination Section remanifested itself.

The three deputy Chiefs of Staff are an embryonic general staff and they provide the only general management center existing at the departmental level today. Unfortunately neither the character of this vital need nor the requirements for adequate staffing in the offices of two of the three deputies, is recognized by the Department. Neither the Deputy for Plans and Research nor the Deputy for Operations and Administration, in fact, has adequate staff assistance. I do not suggest that more people are needed at the Departmental level. There are too many now. What is needed is reorganization and redistribution.

A Special Purpose Organization

I have been told that the far-sighted staff officer who made the recommendation to General Pershing that he adopt the French Field Army-type organization, also advised him that he made this recommendation with the greatest reluctance and for a surprising reason.

It is said that he first pointed out that the organization was only that of a field army headquarters; that it bore no close resemblance to the higher headquarters then existing in the French military system; that it was unlike the headquarters of the French War Ministry, which had the problem of providing military resources rather than directing their employment.

It is said that he concluded by saying that he had some fear and trepidation because of the possibility that if this organization worked for the purpose intended, it might become the paragon and model of organization for all the major army commands, including the War Department; and that it might even be taught as doctrine in the Army's Command and General Staff School, merely because we had used it for a special purpose to fight a successful campaign under special circumstances. A search of the records should be a challenge to the enterprising student of military history to prove the validity of this tale.

These words of caution, if true, were prophetic, even if they went unheeded. When General Pershing returned as our senior military statesman, he deservedly became Chief of Staff.

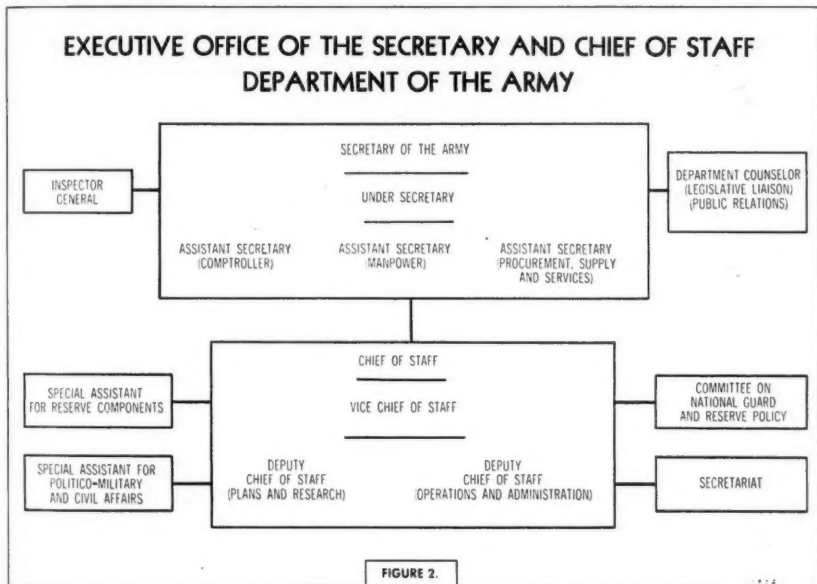
It was not long until the War Department—with almost totally different functions—adopted the organization of a headquarters of a French Field Army. This was done despite the fact that the French themselves did not employ it in their own War Ministry, and despite the fact that the missions of a division, corps or field army are substantially different from the primary mission of the War Department.

Actually, upon his return to become Chief of Staff, General Pershing still regarded himself primarily as a field commander; as a commander of field forces. The General Staff organization he caused to be adopted was conceived by him to be the inchoate headquarters of the field command he would establish in the event of war. It was under General Pershing that the General Headquarters (GHQ) concept was put forward, and which remained as the central guide around which our war planning was conducted between the world wars. As late as 1940, the establishment of the GHQ at Fort Humphreys was still doctrine; and the first steps toward activating it were carried into effect. It

is not entirely clear just who would have been left behind under this concept to assist the Secretary of War in the gargantuan task of mobilizing and creating the military resources which would have been committed for employment. Viewing the Departmental General Staff through the perspective he held, it was not difficult to understand why General Pershing undoubtedly thought it appropriate to the

Proposed Organization

It is against this backdrop that the second and concurrent reorganization proposal is here advanced. It is a first step, to be sure. It would not represent a violent break with the tradition which grew out of the historical accident which occurred at Chaumont. It could be made to work effectively if the underlying organization were changed as here proposed,



primary mission he had in mind for it to discharge, to adhere to the GHQ concept.

Even if this had not been the concept which so long persisted, given a suitably organized and underlying operating structure as proposed here, a departmental staff so organized might conceivably have been able to do a better job of management in dealing with the task, but if—and only if—it were also clearly apparent that the governing concept envisaged its primary mission as that of developing, creating and supporting military forces for later employment.

pending the accumulation of further experience.

Home Office Organization

The organization shown in Figure 2 is proposed for the Executive Office of the Secretary, Department of the Army. The Secretary is the civilian head of the establishment, and under the law is responsible for its command and management. Associated with him in the Executive Office, and as his principal alter-ego and general assistant, would be the Under Secretary. There would be three Assistant

Secretaries—one for Manpower, one to be Comptroller, and the other for Procurement, Supply and Services. The established concept is that there shall be civilian control over the military establishment. If control over any organization is to be intelligently exercised, participation in the considerations leading to a decision is essential. The civilian heads of the Army establishment must be sufficiently oriented, informed, and educated to exercise authority and discharge responsibility for control of the establishment and to make intelligent decisions. It is on this basis that the organization of the Office of the Secretary is proposed.

Under the Chief of Staff as the senior military officer of the Army establishment and chief professional advisor to the Secretary and his civilian assistants, there would be a Vice Chief of Staff and two Deputies. The two Deputies, respectively, would be charged with responsibilities for Plans and Research and Operations and Administration. It is essential that Research and Development be closely tied together with forward strategic planning. It is also essential that the officer whose heavy responsibilities for the day-to-day management of current problems—operations and administration—give his full time to this important work. He cannot also be expected to deal with the future. He cannot be the planner.

Politico-military affairs continue to be of such growing importance each day that a special assistant to the Chief of Staff is provided. He would play an important role both with respect to forward strategic planning and current operations. A Special Assistant to the Chief of Staff for Reserve components is also suggested. This would tend to avoid the necessity for creating still another bureau. All of the best thought and all of the best resources of the Army staff should be directed toward the creation and administration of effective Reserve components. The statu-

tory committee for a National Guard and Reserve policy would continue to exist—mostly because of the “political” facts of life.

The Secretariat would perform the same functions, relatively although expanded, that the Secretary, General Staff now performs, except his functions would cover the entire executive office. The Secretary, General Staff would, in fact, be the coordinating administrative element of the Executive Office.

Army Staff

Figure 3 delineates the staff elements which would exist at the departmental level, namely, the general, special, and technical staffs. Although the heads of the General Staff divisions are in reality administrative directors, they are nevertheless still designated as Assistant Chiefs of Staff, but however named, there would be five bureaus. That is what they have been since they were created; that is what they still are.

The five general staff bureaus or divisions proposed would not be tied to any subordinate elements of the establishment by an umbilical cord. This would tend to relieve them of the heavy administrative load now carried and which so engulfs as to prevent them from functioning as a staff. As noted from Figure 1, there would be respectively, Manpower, Intelligence, Forces Development, Procurement, Supply and Services, and Operations. Forces Development would include psychological warfare, research and development requirements, and troop basis within the span of its staff responsibilities.

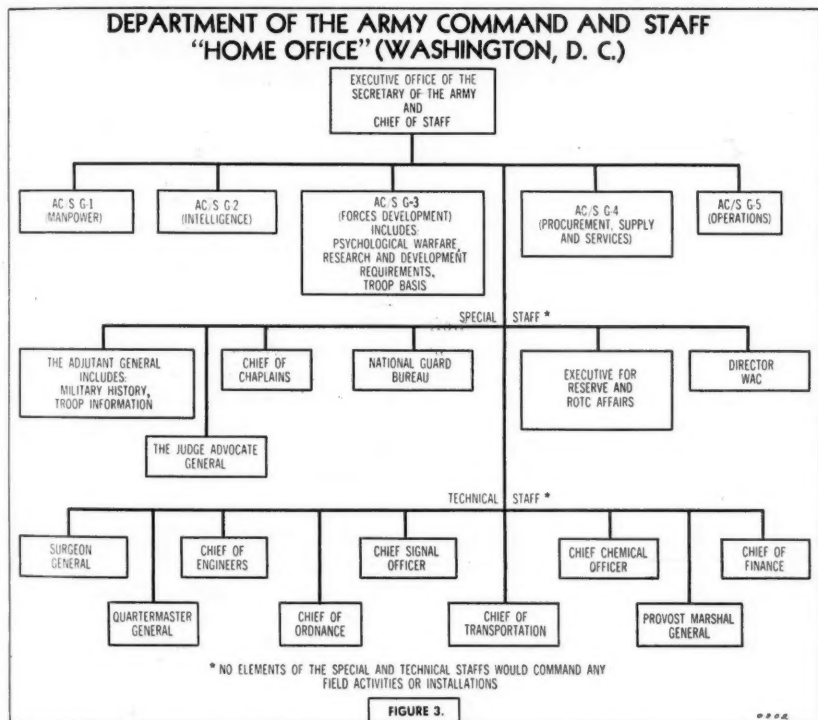
The *General Staff* or the real staff of generalists would be provided by the Deputy Chiefs of Staff.

The *Special Staff* would be as indicated in Figure 3. The *Adjutant General* would include in his office, military history and troop information.

The *Technical Staff* would consist of

those sections indicated in Figure 3. The heads of these sections would not be commanders as now. They would be technical staff officers. As the senior technicians of so large an establishment as the Army, they would be accorded rank and title appropriate to such responsibilities. They would be purely staff officers. Their of-

Comptroller must in fact be a Deputy Chief of Staff with authority commensurate with that delegated to the other two. As a practical matter, it might be in the interest of the Army establishment to adopt a solution calling for a civilian Comptroller with the rank of Assistant Secretary. The budget-making process and



files would be relatively small. They would assist the Army's staff of generalists in viewing objectively various program areas. They would have no field agencies and command no Class II activities or stations.

As to whether or not the Army Comptroller should be a civilian with the rank of Assistant Secretary or a Deputy Chief of Staff, either solution will work provided that in the case of the latter solution, the

the subsequent apportionment, allocation, obligation, expenditure, and accounting, functions require, in substantial degree, the existence of mutual confidence between the Comptroller and the other agencies of the executive and legislative branches concerned. The Army has been fortunate in having had as its first two statutory Comptrollers, military officers of unusual capacity, ability, and competence. It may

well be that we could count on such good fortune for the indefinite future. On the other hand, the exercise of the Comptroller function is a profession in itself and calls for training and experience which is not necessarily associated with the demanding requirements to be met to qualify a man as a competent, professional soldier.

The home office would become substantially smaller in size and infinitely more effective. I believe it would be reduced to at least one-third of its present size.

Summary

In summary, if the proposed organization were adopted:

1. The present field organization of the Army, now charged with generation and development of ground forces and their support would disappear.

2. The Technical Services, *as now organized*, would cease to exist. The Chiefs of Technical Service would no longer be major commanders with field activities and stations.

3. The six continental armies, in reality, geographical administrative commands, would be disestablished.

4. Five major commands (Personnel, Combat, Development, Procurement, and Service) plus the Army Audit Agency and such Special Commands, as might be required, would make up the field establishment charged with the generation of ground forces, their equipment, supplies and support.

5. The Departmental or home office would preside over and would manage these commands. It would be substantially smaller in size—probably one-third of its present size.

6. Operations would be decentralized and control would be centralized.

This is a subject of great moment—one as to which action should no longer be deferred. It is too costly to continue the present organization. We can buy more defense with fewer dollars. Now is the time.

It has been said that there are many gates to heaven. This, I do not know, of course, but I would concede that there are probably several solutions to this problem. However, on no one solution will all men presently agree. We cannot afford to await the millennium.

NEXT MONTH

The February issue of the *MILITARY REVIEW* will feature the article *Bear Facts* by Colonel John A. G. Gavin, an instructor at the Command and General Staff College. The author provides a detailed account of the problems which were involved in installing a renewal of confidence in the members of a unit which had been engaged in a retrograde movement over an extended period.

North Polar Strategic Cartography, from "Aeronautics" (Great Britain), will be included in the Foreign Military Digests section of the magazine. The great oceans have immense significance in current strategic planning because no state can claim sovereignty over the oceans except by employing superior force. Today the rivalry that once existed on the seas has been transferred to the skies, and thus the air over the oceans is almost as important strategically as the waters of these same oceans were when marine power was supreme. Because flight over land is limited by sovereign rights over pockets of air space, the ocean zones of the northern hemisphere are the most important ocean air zones for strategic military aviation planning. For many reasons, present-day maps are all but useless in the polar regions, and the author advances his solution to this problem in his article.

MILITARY NOTES

AROUND THE WORLD

UNITED STATES

Pilotless Bomber

The *B-61 Matador* pilotless bomber brings push button war a step nearer. The *Matador* needs no special permanent equipment at the launching site and its present



Matador brings push button warfare nearer.

launcher can be towed from spot to spot quickly. It is now being used to train this country's first pilotless bomber squadrons. A rocket gives the bomber the thrust necessary to become airborne, after which a turbojet engine takes over to furnish the power.—News release.

All-Weather Fighter

The nation's first delta-wing, supersonic, all-weather fighter, the *F-102*, recently made its first flight.—News release.

Copying Camera

A lightweight, compact, and rugged copying camera designed to keep pace with quantity reproduction of military maps in the field has been developed at the Engineer School. It is 13 feet long and constructed principally of aluminum alloy, permitting it to be transported intact both by air and by truck doing away with the need of disassembly and re-assembly common in World War II models. It makes negatives of up to 24 by 30 inches of map copy.—News release.

Stratofortress Remodeled

The new *B-52A Stratofortress* will have a changed nose and crew compartment design it was revealed. The present *Stratofortress* has a tandem cockpit arrangement for the crew while the new model will have side-by-side seats for pilot and copilot.—News release.

Huge Sphere

Rising as high as an 18-story building, the huge sphere which will house the prototype of an atomic power plant for submarines is ready for the final tests. The big ball is made of inch-thick steel plates joined together by more than 5 miles of welding and contains more than 3,850 tons of steel.—*Science News Letter*.

Pilotless Target Plane

The Ryan Q-2 *Firebee*, a near-sonic speed, recoverable drone, serves as a target for modern defense weapons. It is designed to offer a high-speed target capable of simulating piloted jet plane maneuvers for the training of antiaircraft crews. It



Drone target shown being ground-launched.

is equally adaptable for ground-to-air tracking and firing, and for air-to-air interception problems.

It is approximately less than half the size of present-day jet fighters having a 12-foot span and 18-foot length. The drone is powered by a J-44 turbojet engine and can fly at high altitudes. It is operated from a "black box" remote control station and a two-stage parachute system decelerates the drone and lowers it safely to the ground for future use. The *Firebee* has been launched on numerous flights both from the belly and wings of twin-engine "mother" aircraft as well as from the ground.—News release.

Rocket Motor

A newly developed rocket propulsion motor has the power of two 2,000 horsepower locomotives and can be applied to aircraft, torpedoes, gliders, aircraft catapults, and landing craft. It can be economically mass-produced and works on fuels that are plentiful. It can develop 10 tons of thrust at full throttle.—News release.

Contact Lenses

Four types of contact lenses, as well as ordinary spectacles, were tested by the Army Medical Research Laboratory in various activities in different temperatures, even to the extremes of 40 degrees below zero and 120 degrees above, and at a simulated altitude of 20,000 feet. It was found that the contact lenses were for the most part superior to spectacles in the field tests, while for ordinary use, old-fashioned spectacles had many advantages.

Rain, snow, and mud present no problem to contact lenses and frosting and steaming is avoided. While headgear, sighting devices, and gas masks all present problems to the spectacle wearer, they do not bother contact lenses. Light is not reflected by contact lenses while spectacles do and are likely to reveal a hidden position.

The disadvantages of contact lenses include their cost, and the time and skill required to fit them. They are difficult to keep clean, easily lost, the glass ones are easily broken, and the eyes are more sharply irritated by gases, smoke, and dust. The length of time that contact lenses can be worn is limited, also and some require an accessory fluid.—*Science News Letter*.

Cannon Propellant

Production of a new and advanced type of cannon propellant, known as nitroguanidine propellant, has started at the Sunflower Ordnance Works. The new propellant will give higher velocity which is required for deeper penetration and additional distance. The operation and accuracy of weapons utilizing the nitroguanidine propellant will be improved. It is a cooler burning propellant and as a result there will be less erosion of the weapon resulting in its longer life. The new propellant contains nitrocellulose and nitroglycerine in addition to the nitroguanidine.—News release.

Wind Tunnel

The world's most powerful supersonic wind tunnel, to be used by the Air Force in developing future planes and guided missiles, is under construction at Tullahoma, Tennessee. Five giant compressors running in tandem will feed the machine which is capable of generating 216,000 horsepower and producing gales of 2,500 miles an hour.—News release.

Winter Training

A 3-month mountain and cold weather training maneuver beginning in January will be held at Camp Hale, Colorado. The exercise will involve patrols, anti-guerrilla operations, and logistical training under extreme cold.—News release.

Vehicular Antennas

The possibility of using flush-type radio antennas on Army vehicles instead of the whip type is being studied by the Signal Corps. It is felt that the flush-type would not ground-out on overhanging obstacles, would decrease the silhouette, and would not be as subject to being broken by shell fire and overhanging obstacles.—News release.

Hospital Ships

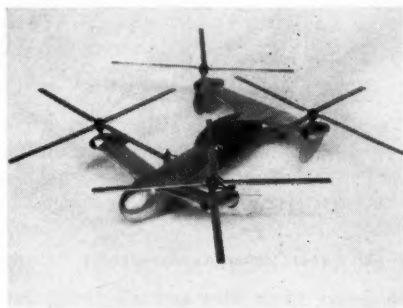
Navy hospital ships are no longer required to carry the green horizontal hull stripe as part of their identification markings under new regulations. The new instructions state that the exterior surfaces shall be white and a minimum of one red cross painted on each side of the hull. The green stripe on United States hospital ships was not prohibited by the Geneva Conventions but authorities felt the green blended with the red crosses at a distance, making the crosses more difficult to distinguish. Other marking changes included the addition of four red crosses on the stack and one red cross on the forward vertical face of the superstructure.—News release.

Speed-Measuring Device

To help fast-flying jets land safely on aircraft carriers, radar speed-measuring equipment has been developed. The device clocks the approach of a plane by automatically co-ordinating the speeds of the aircraft, the carrier, and the wind, and warns the landing signal officer. The landing signal officer in turn warns the pilot. Speed which is either too fast or too slow is dangerous and with jet aircraft there is very little spread between the two.—News release.

'Quadrotor' Helicopter

Work is progressing on the prototype of a 4-rotor helicopter in which the blade retention system and control features permit utilization of economical and aerodynamically efficient extruded blades. A small machine with intermeshed rotors is intended as a high performance, compact,



Military version of "Quadrotor" helicopter.

military machine powered by four *Ar-touste II* shaft turbines. This design should provide improved handling qualities.

The small high-speed rotors will extend the available speed range of the helicopter by reducing the high-speed vibration and control problems of conventional rotors. The thin blade sections made possible will permit the higher forward flight tip speeds sought by the helicopter industry.—News release.

Recognize Leadership

Only those enlisted persons in the grade of E4 and up, who hold leadership or supervisory positions, will wear noncommissioned officer stripes in the Army's new program to distinguish between noncommissioned officers and specialists. No pay grades will be changed, but recognition will be given to those who carry the responsibility of leadership. A special insignia will identify and mark the grade of specialists.—News release.

Super Sabre

The first operational jet fighter of the Air Force to exceed the speed of sound in level flight is undergoing final testing. Details of the *F-100 Super Sabre*, long classified, indicate that the plane has a



F-100 Super Sabre is supersonic fighter.

45 degree swept wing and tail, both razor thin.

The plane has a service ceiling of above 50,000 feet and a combat radius of more than 500 nautical miles. The *F-100* is larger than most existing fighters, being 45 feet long, 14 feet high, and having a wing span of 36 feet. There is a one-piece clamshell canopy affording excellent all-around visibility. Titanium, the new, heat-resisting metal, is used extensively throughout the plane. A *J-57-7* turbojet engine with afterburner powers the plane.—News release.

Lagging Reserves

A "disappointingly low" number of draftees were joining organized reserve units after completing their active service according to top military reserve officials. The next 6 months should determine if the nation can maintain a strong reserve on a voluntary basis and if not, some system of compulsory assignment of men to reserve units may have to be established they said. The Army is having the most difficulty recruiting active reservists, who would be among the first called to back up the regular military forces in the event of war. Of the tens of thousands of men discharged since July, only 4 percent have signed up for reserve units.—News release.

'Detached Service'

The use of the term "detached service" and the status it implies has been abolished within the Army establishment. Personnel who must be absent from their assigned stations on proper orders for duties elsewhere will be considered to be on "temporary duty."—News release.

Aluminum Footbridge

Easier to transport, faster to handle, and more stable in swift river currents are some of the claims for a new footbridge of light aluminum construction being used by the Army to replace the old *M1938* model. The new bridge is made of corrugated aluminum treadways which are supported by aluminum I-beams laid across pontoons made of sheet aluminum with riveted beams.

It is more durable for combat use and can be stored for longer periods than the old model. It requires two 2½-ton trucks with pole trailers to carry a complete set for a 472½-foot span. Time for assembly normally is 15 minutes plus 1 minute for each 15 feet of bridge. It can be used as a light vehicle bridge or to construct light vehicle rafts.—News release.

Antisubmarine Airship

The ZP4K, a new version of the K-type antisubmarine airship, is now in production. The new blimp will have a capacity for 527,000 cubic feet of helium and will have special equipment for refueling from naval surface craft which will increase its operating range. It has a top speed of 65 knots and can also hover motionless for hours when detecting enemy undersea craft.—News release.

Homing Device

A cheap, portable radio homing device, resembling a television antenna, has been developed for helicopters at Donaldson Air Force Base. The unit sends radio signals that are picked up by incoming helicopters. This is expected to speed up the evacuation of casualties. It is smaller and easier to handle than other guides. The device costs only a few dollars to build, weighs but a few pounds, and can be set up and dismantled in minutes.—News release.

'Pen Pals'

A recent Army regulation directs all commands to block any effort which promotes interchange of personal communications between persons not previously known to each other. It orders commanders to actively discourage soldiers from participating in "pen pal" clubs, "chain letter," "round robins," or other "blind" correspondence. The regulation is designed to combat subversive elements.—News release.

Streamlined Periscopes

The Navy's submarines will be able to move faster without detection while scanning the sea for targets with new streamlined periscopes. The new periscopes cut down splashing or pluming of the "up" periscope on fast-moving submarines. The vessel's eye is not blinded at high speeds as the sleek lines keep the periscope from vibrating.—News release.

Largest Transport Helicopter

America's first twin-engine tandem transport helicopter, the YH-16 *Transporter*, is capable of accommodating 40 troops, 32 litter patients, or 3 jeeps. The *Transporter* weighs twice as much as the



New YH-16 *Transporter* is world's largest.

largest helicopter in service today. Its over-all length is 134 feet and its height is 25 feet. Its cruising speed will be faster than that of any present helicopter. The YH-16 was originally conceived as a long-range rescue helicopter, but its enormous load-carrying capacity has led the Army and Air Force to expand its application to military logistics operations.—News release.

Retain Rifle

In the interest of economy in training and for the combat readiness of the individual, a single rifle will be retained as long as possible by an individual in the Marine Corps. The individual marine will turn in his rifle only when he transfers from one post to another in a public conveyance or privately owned vehicle. Until recently the marine drew a new rifle each time he reported to a different station and sometimes even when reporting to another unit on the same post. This will make the marine and his rifle even more inseparable.—News release.

ARGENTINA

Multipurpose Plane

Flight testing of the *IA 35*, multipurpose, twin-engine plane has begun at Cordoba. The plane can be used as a trainer, light bomber, reconnaissance, ambulance,



Multipurpose plane produced in Argentina.

cargo, or for other miscellaneous duties. The plane is powered by two *19-C El Indio* engines. As a bomber the plane would carry a crew of five, but when used as an ambulance, it would carry a crew of three, a doctor and a nurse, and have space for four litters.—News release.

WESTERN GERMANY

Record Budget

The West German *Bundestag* (lower house of Parliament) recently approved a 1953-54 budget equivalent to slightly more than 6½ billion dollars.—News release.

BRAZIL

Oil Operations

The state has taken over oil operations in Brazil and among the first projects are extensive drilling programs in the Amazonian region where huge sedimentary formations, believed to be favorable for the accumulation of oil and natural gas, underlie areas of jungle and brush. A well has been sunk at Badajos, near the Capim River, reaching 12,000 feet underground. Only small quantities of petroleum are produced now.—News release.

USSR

Soviet Helicopter

Large-scale production of the Soviet version of the *H-19* helicopter, capable of carrying 10 to 12 passengers, has been started. The plane, a copy of the United States *H-19*, was used in war games and shown at an air show.—News release.

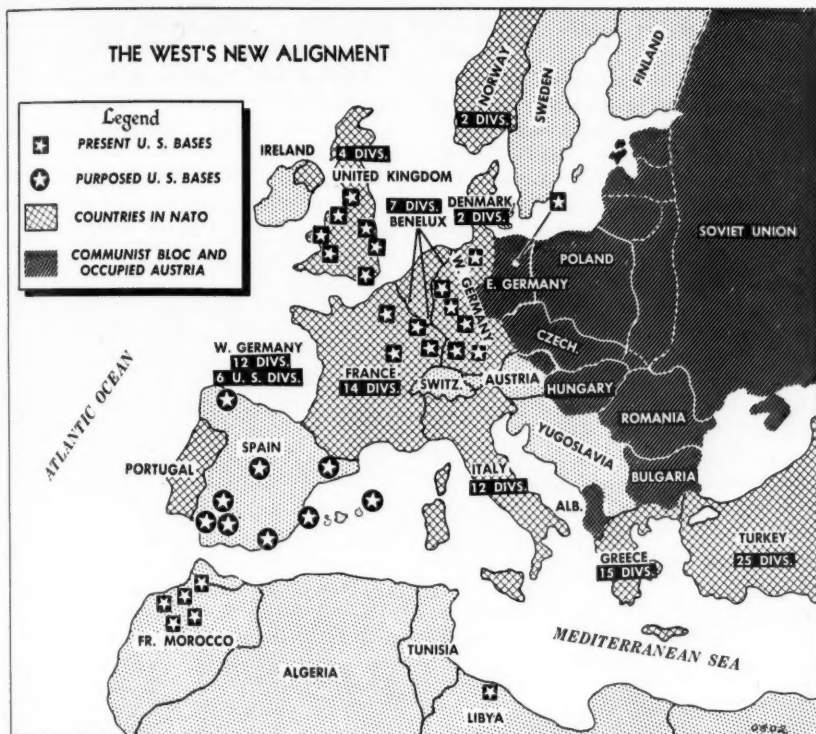
Antiaircraft Rockets

The Soviets are placing increasing emphasis on rockets for defense against air attack according to the magazine, *Aviation Age*. A number of rocket installations are located in the Baltic states, one being at Haapsalu in Estonia. Many of the rockets are models of captured German originals but the Soviets have developed some of their own.

One Soviet development is a tactical, multipurpose missile, usable both as a surface-to-surface and surface-to-air weapon. Its thrust is reported to be 17,600 pounds, and it has a range of 35 to 40 miles. It has no remote control guidance. Standard equipment of Soviet antiaircraft units consists of improved versions of the German *C-2 Wasserfall*, the *Taifun*, and the *Henschel Hs-117 Schmetterling*.

The Soviet *C-2* is reported to have a thrust of 17,600 pounds, and a range of almost 625 miles. It is intended as a mobile weapon and its launching platform can be driven over rough terrain. The *Hs-117*, which looks like an airplane, is ground launched and designed for use against attacking bomber formations. Service ceiling for this rocket is said to be 49,200 feet. Maximum speed is 683 miles an hour and the range 20 horizontal miles.

Reports state that a remote controlled version of this weapon can be fired from aircraft in flight. It can also be used against ground targets. The Soviets have developed a ramp-launched delta-wing rocket resembling the Convair *XF-92A* and winged bombs known as *Novaya Katyusha*.—*Aviation Age*.



BELGIAN CONGO

Air Crossroads

An air and military base at Kamina in the Central Congo, now nearing completion, will serve as an alternate air crossroads for Belgium and her allies if, in the event of war, the North African coast route is denied them according to a representative of the Belgium Ministry of War. He said the base was halfway between the west and east coasts of Africa. The base has at present two landing strips 3,957 yards long, capable of taking planes up to 135 tons, and they can be extended indefinitely. An auxiliary strip for fighter planes is under construction. This will be 8 miles long when completed.—*The New York Times*.

PERU

Attack Submarine

A new modern attack submarine, the *Tiburón*, recently joined the Peruvian Navy. Built in the United States, the vessel, the first of two, incorporates streamlining, the snorkel, and other modern features developed in the submarine field during and after World War II in addition to some original features. About 20 members of the Peruvian Navy have been present during the construction of the craft studying the latest details.—News release.

DENMARK

Soviet Tanker

The second tanker built for the Soviets was launched recently.—News release.

AUSTRALIA

Aircraft Carrier

Completion of the aircraft carrier *Melbourne*, being built in the United Kingdom for the Royal Australian Navy, will be delayed approximately 6 months while the recently-designed type of angled flight deck (MILITARY REVIEW, Mar 1953, p 66 and Dec 1953, p 63) is added to it. The new type deck is being added to some of the British and United States aircraft carriers. It is believed that the new design will greatly aid carrier landings for jet aircraft.—News release.

Future Navy

Small ships firing guided missiles, instead of guns, will replace heavy fighting units in the navy of the future according to the flag officer commanding Australia's fleet. He stated that no guns bigger than 6-inch caliber would be used in future navies. The air threat has forced a change from heavy fighting ships to lighter vessels, fast aircraft carriers, and submarines according to the officer.—News release.

TURKEY

Naval Base

The Turkish Navy recently activated the multimillion dollar Iskenderun naval base and training center built with United States funds and designed to serve as the eastern anchor for allied Mediterranean fleets. Situated in an excellent natural harbor, the installations include machine and repair shops, a floating drydock, refueling facilities, and training centers.

Iskenderun, located in southern Turkey, is linked by a new military highway with Erzurum near the Soviet frontier and to Adana by another new military highway to be built along Turkey's Mediterranean coast. The base is designed for rapid expansion in the event of an emergency.—News release.

BELGIUM

Aircraft Industry

A large order for Hawker *Hunter* fighters, one of the world's fastest planes, has been placed by the Belgian Government for construction within that country. Another large order for the plane has been placed with Belgium under the offshore procurement program of NATO.—News release.

SPAIN

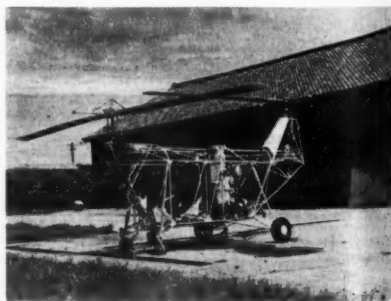
Underground Station

The largest underground station in Europe, Atocha, linking the railways from all four sides of Spain, is nearing completion in Madrid's suburbs.—News release.

NATIONALIST CHINA

Tandem Helicopter

The Air Force of Nationalist China has completed preliminary studies on the *CJC-3*, a tandem helicopter. It has an overall length of almost 33 feet and an overall height of about 10 feet. It is expected to



China's Air Force may get *CJC-3* helicopter.

have a maximum rate of climb with forward speed of 1,540 feet a minute and a service ceiling of 16,800 feet. Landing gear is of the 4-point type, with both nose wheels fully swiveled. The cockpit provides for 2-place, side-by-side seating and dual control. The two main rotors are the 2-blade seesaw type.—*American Helicopter*.

GREAT BRITAIN

Prestwick Pioneer

The *Prestwick Pioneer*, the first product of the aircraft industry in Scotland, is being used by the Royal Air Force as communications aircraft in Malaya. In addition to its useful load-carrying capac-



Prestwick Pioneer used by RAF in Malaya.

ity, the plane has remarkable landing and take-off characteristics, derived from special high-lift devices on the wings. Its generous area of slots and flaps gives it an outstanding low-speed performance. It can fly slower than 30 miles an hour and is designed for use on short landing strips. It is capable of climbing at 700 feet a minute with a top speed of 130 miles an hour. The plane has a wingspan of 50 feet.—British Information Services.

Steel Shortage

The Belfast shipbuilding industry has run out of steel plate and will not be able to lay a keel for another ship until 1954 according to a leader of the industry.—News release.

Baby Jet

The *Saro* engine, measuring only 47½ inches long and 6 inches thick, may introduce the helicopter into the jet age. The baby jet engines would be fitted to the ends of the rotor blades to whirl them around instead of a piston engine housed in the fuselage.—News release.

Restore Privilege

The privilege of allowing enlisted British servicemen to buy their way out of the armed forces has been restored according to the War Office. A man who voluntarily enlisted may buy a discharge for as little as \$182 if he has not been notified that he is going overseas or if he is not already overseas. There are restrictions for men possessing certain skills but most of them may purchase their discharges for prices ranging from \$224 to \$350. The practice was halted after the outbreak of the conflict in Korea.—News release.

All-Weather Interceptor

Britain's latest all-weather interceptor, the *Javelin*, has been selected for production with super-priority. The plane is capable of meeting an enemy raiding force flying at altitudes of up to 60,000 feet, over the top of bad weather, and at speeds



Javelin, all-weather interceptor, joins RAF.

of 600 miles an hour. The *Javelin* is powered by two *Sapphire* engines.

It carries a crew of two, a pilot and a radar operator, who are seated in tandem beneath a long "greenhouse" canopy. The radar is carried in the nose of the plane. It is a delta-wing design and a distinctive feature of the plane is the large fin and rudder, topped by a small, triangular tailplane.—British Information Services.

FRANCE

Goods Exchange

A 3-year trade pact calling for the exchange of goods and materials totaling \$68,570,000 has been entered into by the Soviet Union and France. The Soviet Union is to export corn, coal, chromium, manganese, asbestos, oil, and grain in exchange for textiles, silks, citrus fruits, lifting and transport equipment, steam boilers, and cargo ships up to a capacity of 5,000 tons. Payment for delivery of the goods is to be made in French francs.—News release.

Airplane Battery

A nickel-cadmium aircraft battery, which may last the lifetime of an aircraft, has been developed in France. They are about three times as expensive as conventional lead-acid batteries which have a peak endurance of about 100 hours but the new batteries have numerous cost-offsetting advantages. They can be placed anywhere in the plane where the designer can find room because they are hermetically sealed and never require refilling with water.—News release.

AUSTRIA

Trade Agreement

A 34 million dollar trade agreement under which Czechoslovakia will exchange coal for Austrian steel and refined steel products, semi-manufactured aluminum products, ball bearings, cranes, and other industrial goods has recently been signed by the two countries.—News release.

FINLAND

Romanian Pact

A trade pact lasting until December 1954 has been concluded between Romania and Finland. Under the terms of the agreement, Finland will get oil products, chemicals, and wood products in return for machinery, cast iron pipe, and other goods.—News release.

SOUTH AFRICA

Recruit Training

In January, 9,000 young men will be assigned to Army, Air Force, Navy, and Marine Active Citizen Force Units throughout the Union to begin the Union Defense Force's new training plan whereby recruits will spend an initial continuous training period of 3 months in camp. The plan has been designed to increase the efficiency of the territorial training system and to build up a more valuable pool of trained reservists which would form the backbone of an expeditionary force in time of war. The majority of the recruits will be assigned to Army units. Training periods have been staggered and camps will start in the months of January, May, and September.—News release.

Titanium Deposit

A large deposit of titanium ore—the wonder metal—has been discovered on the Natal South Coast around Umgababa Station. It is claimed that there is more than 1 million tons of ilmenite ore containing 50 percent titanium oxide in the area. Titanium is of value to jet aircraft, as it is claimed to be the only metal that does not melt at supersonic speeds. It is lighter and stronger than steel and has high resistance to corrosion from acids and sea water.—News release.

Blind Approach

A new blind approach radar system—ground controlled approach—has been installed at the South African Air Force Station, Lengebaanweg, in the Cape Province, a training base for combat pilots.

The new equipment is capable of detecting aircraft within a radius of approximately 60 miles, measuring their range and bearing, and thus enabling ground controllers to guide the aircraft toward the airfield by giving landing instructions to the pilots over a radio-telephone system.—News release.

FOREIGN MILITARY DIGESTS

The Kamikaze Attack Corps

Digested by the **MILITARY REVIEW** from an article by Captain Rikihei Inoguchi and Commander Tadashi Nakajima, former Imperial Japanese Navy, in "United States Naval Institute Proceedings" September 1953. Copyright 1953 by the U.S. Naval Institute.

THE setting sun cast lengthening shadows on a scene of wild disorder at Mabalacat Field. The two airstrips at this base had been raided by enemy planes in the morning, as had Banban Field across the river, the three Clark Field strips just beyond Mabalacat Town and the two Marcot strips south of Clark. Each of these Luzon airfields, located midway between Lingayen Gulf and Manila, had been thoroughly bombed and shot up. All hands worked desperately to clear debris so that planes could be readied for an early morning take-off. The frantic atmosphere was understandable.

Two mornings earlier, on 17 October 1944, a lookout station on the tiny island of Suluan, at the entrance to Leyte Gulf, had radioed, "Enemy force sighted!" This electrifying message was followed shortly by another and final one which said, "The enemy has commenced landing. We are burning confidential documents. We will fight unto death. Long live the Emperor!"

That day more than 100 carrier planes swarmed over Manila, Legaspi, and Clark Fields in determined attacks which were extended next day to include targets in

Mindanao, the Visayas, and even northern Luzon. The enemy's intention to recapture the Philippines was abundantly clear, even before any large-scale landings were begun.

Upon the invasion of Suluan, Admiral Soemu Toyoda, Commander in Chief Combined Fleet, alerted all combat naval forces for the ironically-named Operation *Sho* (Victory). On 18 October the order came from Imperial General Headquarters in Tokyo to launch decisive battle against the enemy at this outer perimeter of the crumbling empire. This onslaught by the allied powers came as no real surprise. After the fall of Biak Island, in western New Guinea, followed by seizure of the Marianas, Japanese planners well knew that the Philippines could be next. If they were, it had been decided that all available forces, Army and Navy, would be committed to their defense in the hope of turning the adverse tide of war.

The odds were tremendously against Japan. Her early supremacy, especially at sea, where the greatest successes had been achieved, had long since waned. Four months earlier, in the Battle of the Phil-

ippine Sea, the Japanese fleet had suffered such an overwhelming defeat that it was no longer capable of challenging the enemy in an ordinary naval engagement. Japan's only offensive resources were her land-based air fleets, whose pilots were pitifully inexperienced, and the fire power of her surface ships, which lacked the support of carrier planes.

Operation *Sho* strategy relied most heavily upon the planes of the Army and Navy, which were all concentrated at land bases for the first time during the war. They were to launch decisive attacks as enemy invasion forces approached the defensive barrier which extended from Okinawa to the Philippines. Our wingless surface ships were to drive down from the homeland and up from Malayan bases to oppose the invasion.

Philippine Defense

Tremendous efforts were made in this extraordinary attempt to defend the vast area of the Philippine Islands, but it was too late. The ever-quickenning tempo of allied offensives allowed no time for the defenders to make preparations. Relentless air raids on Mindanao prevented the build-up of Japanese air power there, and even forced its withdrawal to the central and northern Philippines. The enemy's carrier planes even made strikes at Okinawa and Formosa bases, destroying fighting power which could have been available in defense of the Philippines.

The rapid enemy offensives had not allowed time in which to train fliers for Admiral Ozawa's carriers which were to come down from the north as Kurita's ships approached from the west and south; but then there was not even opportunity for a briefing between these two commands, so relentless was the drive of the enemy. Reinforcement convoys bound for the Philippines were subjected to endless submarine attacks before reaching their destination. Despite every effort, lit-

tle actual progress had been made toward achievement of our goal for Operation *Sho*.

Allied landings at Leyte, coming a little sooner than expected, had caught the defender's naval air strength at a pitifully low ebb. Four months earlier Japan had committed the cream of her veteran naval aviators in a futile attempt to thwart the enemy invasion of the Marianas. As a result, Japanese air strength in the entire Philippines area on 18 October consisted of about 70 Army and 35 Navy planes. Reinforcements were expected from Formosa and the homeland to the extent of about 230 planes and pilots, but most of the latter, while eager for battle, were seriously deficient in training.

The sands of time were rapidly running out on a grave situation. Everyone was aware that it would take a miracle to save the empire. However, indoctrination had given us assurance that our country could count on divine blessing to deliver us from such a crisis. It was becoming apparent that neither surface, carrier, bomber, nor submarine forces could work the necessary miracle. It would have to be won, if at all, by fighter planes. Japanese planes were so outnumbered and outclassed that the bombers could no longer operate by daylight with any chance of success. Their activities had to be confined to small-scale sneak attacks made at night or under cover of foul weather. *Zeke* fighters, which early in the war had been so superior to all other planes, were the only type left that could, in any manner, cope with enemy interceptors.

The planes based at Mabalacat belonged to the 201st Air Group. This unit of the 1st Air Fleet had been moved from Cebu after being caught unawares on 12 September in an attack by enemy carrier planes.

In the attempt to rebuild depleted air forces, greatest emphasis had been placed on increasing fighter strength, and fighter

pilots were even drilled in skip-bombing techniques so that they could be employed as fighter-bombers. These pilots understood and appreciated the importance of their responsibility and their morale was very high.

Admiral Ohnishi

As dusk settled over the field, a black sedan drew up in front of the command post. A small yellow flag fluttering from the front of the car indicated that its passenger was of flag rank, but there had been no advance notice of a distinguished visitor. Speculation ended as to whom it might be when the rear door was opened and Vice Admiral Takijiro Ohnishi stepped out of the car. Although his arrival was unannounced, it was well known that he had been designated to assume command of the 1st Air Fleet. Since the death of Admiral Isoroku Yamamoto in April 1943, Ohnishi had been regarded as the foremost exponent of aerial warfare. He had arrived in the Philippine theater only two days before to succeed Admiral Kimppei Teraoka, and so his sudden appearance at this advance base was a surprise to everyone.

The executive officer who received the Admiral was immediately advised to summon staff officers for consultation. When the staff officers had assembled, Admiral Ohnishi was introduced and spoke to them.

The situation is so grave that the fate of the Empire depends on the outcome of Operation *Sho*. Missions have been assigned. A naval force under Admiral Kurita is to penetrate Leyte Gulf and there annihilate enemy surface units. The 1st Air Fleet has been designated to support that mission by rendering enemy carriers ineffective for at least one week. In my opinion this can be accomplished only by crash-diving on the carrier flight decks with Zero fighters carrying 550-pound bombs.

This idea had been discussed in recent days by flying officers, and so it was not new, but the already tense atmosphere was electrified by the Admiral's words. It was now apparent that the purpose of his visit was to inspire these suicide tactics

which he believed to be the only effective means of countering the enemy offensive.

The circumstances leading to this decision are described in Admiral Teraoka's personal diary, under an entry of 18 October, where he recorded his meeting with Admiral Ohnishi in Manila to discuss the use of "special attacks" against the enemy:

We can no longer win the war by adhering to conventional methods of warfare. . . . Instead, we must steel ourselves against weakness. . . . If fighter pilots set an example by volunteering for special attack missions, other units will follow suit. These examples will, in turn, inspire surface forces and army forces. . . .

We conclude that the enemy can be stopped and our country saved only by crash-dive attacks on their ships. Admiral Ohnishi and I are in agreement that he should assume complete charge and responsibility for the formation of a special attack corps.

Organizing the Corps

Within hours after this meeting, orders were received by the 201st Air Group summoning the commanding officer and his air officer to 1st Air Fleet Headquarters the next day. They were late in arriving, causing some concern in Manila that their car may have been ambushed by guerrillas. This risk had to be taken because it was no longer possible to fly our planes during the hours when United States carrier planes were about. That explains why even such an air-minded officer as Ohnishi had come to Mabalacat by automobile.

When Admiral Ohnishi had finished explaining the situation, Commander Tamai, the executive officer, asked permission for a short recess so that he might consult with the squadron leaders. In the absence of the commanding officer, Tamai was in charge, but he wanted to confer with his subordinates before giving an answer on a matter so grave as that proposed by the Admiral. After confirming his colleagues' assent to the proposal, the conference was quickly resumed and he reported with proud determination that his force was ready to co-operate. Tamai concluded his

statement with a prayer that organization of this special attack corps be left to the group itself.

In this command were 23 pilots who had served under Commander Tamai in the Mariana campaign—which they had been lucky to survive. He was confident enough of their fervent loyalty to believe that most of them would dedicate themselves as human missiles when they heard of the plan. He afterward described their reaction: "They said little, but their eyes spoke eloquently of a willingness to die for their country." All but two men of this group volunteered, and these two were both found to be in ill health.

The next step in this mission was the selection of a leader. He must be a man of outstanding character and ability since so much would depend on the success of this unit. It was considered desirable that the man chosen for this task be a graduate of the Naval Academy at Eta Jima, and this served further to limit the list of eligibles. So many Naval Academy flying officers had been killed in action that there was seldom more than one or two of squadron commander rank in each air group, and such was the case in the 201st. The selection was not long in being made.

When Lieutenant Yukio Seki entered the room, it was shortly after midnight. He was addressed by Commander Tamai, who said, "Admiral Ohnishi has brought to our base the idea of loading *Zero* fighters with a 550-pound bomb and having the pilots crash dive on enemy warships. I have recommended you as a proper man to lead such an attack."

Beginning of the End

Shortly after sunrise Admiral Ohnishi summoned the newly-appointed special attack pilots, 24 men, to the small garden adjoining his headquarters. The Admiral spoke, his visage was unusually palid and his voice shook with emotion,

Japan now faces a terrible crisis. The salvation

of our country is now beyond the power of ministers, the General Staff, and lowly unit commanders like myself. It is now up to spirited young men such as you.

At this point tears came to his eyes as he concluded,

On behalf of your 100,000,000 countrymen, I ask you to do your utmost and wish you success.

It is hard to imagine a more poignant and tragic message. This was no mere exhortation to inspire men's fighting spirit. It was an appeal for the extreme sacrifice with no chance of repeal. Never in history had a group of men been asked to carry out such an assignment by their commanding officer.

Admiral Ohnishi's feelings at having to make this request surpass comprehension. A few days after the *kamikaze* (divine wind) attacks had begun, he confided in his senior staff officer:

Several months ago when Captain Jyo kept insisting on this kind of attack, I was loathe to accept his idea. But when I came to the Philippines and saw the actual state of affairs, it was clear that these tactics would have to be adopted. The situation here evidenced how poorly our strategy had been developed. We have been forced into these extreme measures although they are a complete heterodoxy of all the lessons of strategy and tactics.

Ohnishi foresaw some of the criticisms which would be heaped on the extraordinary procedures he had originated. He was known to have lamented to his adjutant on several occasions, "People do not understand my actions today, and a hundred years from now people will still misunderstand the course I am forced to follow."

One-Way Tactics

The one-way character of these tactics made it imperative in Ohnishi's mind that the *kamikaze* attacks be employed only when success was fairly well assured. He felt that such an expenditure of the cream of Japan's youth must not be made if there was any chance that the mission might fail. At the same time he believed sincerely that this method of attack carried out by inspired young pilots was

bound to be successful. He later told his staff,

On my return to Manila after organizing the first special attack corps, I went to Southwest Area Fleet Headquarters to request that the sortie of Kurita's force be postponed until after the enemy had been subjected to strikes by our special attack corps. On arrival I learned that the order for the sortie had been issued just two hours earlier, so I withheld the request lest it merely add confusion to the situation.

attack corps will write their name and rank on a piece of paper and insert it in the envelope; enclose a blank paper if you do not wish to volunteer. You have three hours in which to give the matter serious consideration. There are good reasons for not volunteering. I request that you make independent decisions and not be influenced by your colleagues.

When the evening meal was finished, one of the fliers as usual began to play the piano which stood in a corner of the mess



A new *Kamikaze* suicide weapon, the *Baka*, a piloted bomb, was introduced by the Japanese in 1945. It consisted of a rocket-powered, 3,960-pound missile. The *Baka* is shown above.

Cebu Recruiting

While these events were taking place at Mabalacat, similar recruiting of pilots for *kamikaze* attacks was taking place at other air bases. At Cebu, nearest base to the allied landings at Leyte, all hands were assembled on the evening of 20 October. The commanding officer addressed them as follows:

I have just returned from Manila carrying an order to organize a *kamikaze* attack corps at this base. You are to prepare a sealed envelope by nine o'clock this evening. Volunteers for the *kamikaze*

hall. Tonight's pianist had volunteered to die for his country, and the music was heavy with his emotion. There were few listeners who remained dry-eyed.

At 2100 sharp the senior petty officer pilot came to the commander's quarters, silently delivered an envelope and departed. It was several minutes before the envelope was hesitatingly opened, for there was no way of knowing how many men would offer themselves for this suicide mission. Inside were more than twenty signed pieces of paper; only two were blank.

First Kamikaze Attacks

In the meantime great land and air battles centered on the island of Leyte, but Japanese counterattacks were limited in strength and terribly ineffective. Operation *Sho* plans of Combined Fleet called for reinforcement of the greatly reduced 1st Air Fleet by the transfer of planes from Formosa on 23 October. These land-based planes were then to make an all-out air attack on the 24th. This was to be followed at dawn the next day with a driving thrust into Leyte Gulf by Admiral Kurita's surface forces.

Allied forces had begun landing on Leyte on 20 October and Japanese retaliation was limited to small-scale attacks upon ships in the gulf—with very little success. There were no other air raids throughout the Philippines on this day when Admiral Ohnishi became Commander in Chief of the 1st Air Fleet.

During this period the "special attack" pilots awaited their chance to turn back the enemy advance by hurling themselves at his ships.

On the afternoon of the 21st came the long-awaited flash: "Enemy task force built around six carriers sighted 60 miles east of Suluan Island." Six *Zero* fighters were ordered to take off immediately from the Cebu base.

Preparations were begun immediately and the planes were hauled up to the air strip from their hidden revetments, 1,640 feet down the hillside. As they were lined up for take-off, a flight of enemy *Grumman* fighters suddenly came in to attack and all six *Zeros* burst into flames. Within 10 minutes after this raid, two more "special attack" fighters and one fighter escort plane were manhandled to the strip and they roared into the air above the smoldering base.

This flight was led by the piano player of the previous evening. His plane became separated from the other two, who returned to base when they failed to sight

enemy targets, but he did not come back. It was this plane which led the strikes of special attack missions—first of the organized *kamikazes*.

Mabalacat's First Attack

A more dramatic ceremony attended the first sortie of *kamikaze* planes from the Mabalacat base. When the order was received, Lieutenant Seki was named to lead the first special attack unit. Six young pilots stood in a row and, passing a canteen lid-cup among them, took their last drink of water. Their fellow-pilots, standing by to see them off, took up the ancient song of the warrior, *Umi Yukaba* (When Going Away to Sea). The doleful, but stirring melody wafted out on the morning air:

If I go away to sea,
I shall return a corpse awash;
If duty calls me to the mountain,
A verdant sward will be my pall;
Thus for the sake of the Emperor
I will not die peacefully at home.

But these brave volunteers were not smiled upon by the god of war this day. They failed to sight any enemy force and had to return to their base. Four successive days they sortied, each time in vain; and returned to the field which they never expected to see again. Lieutenant Seki tearfully apologized to the commander for his failure to find his opportunity to die. Surprisingly enough, these pilots did not become nervous or desperate but were as composed as if they had just returned from a routine attack mission.

Meanwhile Japan's war machine, which had long been geared toward facing the allied powers in a decisive battle, was moving inexorably toward its fate. The main naval striking force, led by Admiral Kurita, had left Brunei on 22 October to sail north along the Palawan Island chain and through San Bernardino Strait into the Pacific toward Leyte. Under Admiral Nishimura, one fleet element was headed through the Sulu Sea to transit Surigao Strait for a southern approach to Leyte

Gulf. In concert with these two forces Admiral Ozawa's decoy force, built around carriers practically devoid of planes, was coming from the homeland to lure the enemy task force northward. The 2d Air Fleet, consisting of about 350 land-based planes, was to launch an all-out attack upon the invader on the 24th so as to facilitate the penetration into Leyte Gulf by the Kurita and Nishimura forces.

Any illusions Japan might have entertained about defeating the enemy in a decisive naval engagement were shattered by the events of the three days beginning on the 23d. Early that morning the Kurita force was caught and attacked in Palawan Passage by enemy submarines. Two heavy cruisers were sunk and another was damaged so that it had to drop out of line. Reaching the Sibuyan Sea next day, Kurita's ships, with no protective cover of fighter planes, were subjected throughout the day to unrelenting attacks by carrier planes. This air-sea contest resulted in the sinking of the battleship *Musashi*, whose powerful 18-inch guns had been counted as a great asset for surface engagements. Japanese retaliation that day in the form of an air attack by 226 planes—all that could be mobilized—succeeded in sinking only one light carrier and inflicting some damage to several other ships.

At break of day on the 25th, Kurita's force found itself in the unexpected, unbelievably happy situation of being within sight of an enemy surface force. Coupled with this good fortune was the fact that Ozawa's decoy force was serving its purpose and had succeeded in luring the enemy carrier task force to the north as planned. It was this day that the battleship *Yamato*, the giant of Kurita's force, first fired her 18-inch guns against enemy ships. The first successful *kamikaze* unit attack was carried out this day by six planes which took off at dawn from Davao in southern Mindanao. They scored hits on

enemy escort carriers, southern units of the same force which Kurita's ships had encountered a little to the north. At least three escort carriers were damaged by these sentient missiles.

Another successful special attack this same morning was led by Lieutenant Seki. Escorted by four fighter planes, his unit of five special attack planes left Mabalat soon after sunrise seeking targets against which to make their sacrifice. One of the escorting pilots furnished a report of the action.

Sighting an enemy force of four carriers and six other ships at 1040, distant 90 miles, bearing 85° from Tacloban, Lieutenant Seki banked his plane vigorously to the right and left as a signal and then dived headlong into one of the carriers which he rammed successfully. A colleague followed directly after him and crashed into the same ship, from which there arose a great column of smoke. Successful hits were also scored by two more pilots, one on another flattop, the other on a light cruiser.

A total of 93 fighters and 57 bombers were flown in conventional attacks this day, inflicting no damage on the enemy. The superiority of special attacks was shown, and Admiral Ohnishi's belief was proved true. Hundreds of planes making orthodox attacks could not inflict as much damage on the enemy as a mere handful of *kamikazes*.

News of the successes scored by Lieutenant Seki's unit flashed throughout the Navy to inspire men at home as well as those in the Philippine theater. But even the mighty power of such attacks was not enough to stem the tide of war. The situation was now so grave that Admiral Ohnishi, who had originally urged the use of special attacks only for the initial stage of Operation *Sho*, was convinced that further and extended employment of these inhuman tactics was unavoidable. He pressed this opinion on Vice Admiral Fukudome, Commander in Chief of the 2d Air Fleet, saying, "Nothing short of all-out use of special attacks can save us. It is time for your air fleet to adopt these tactics."

Fukudome considered this advice, deliber-

erated with his staff, and on 23 October announced that his air fleet would carry out *kamikaze* attacks. At this same time, the decision was made to facilitate operations by combining the 1st and 2d Air Fleets. Admiral Fukudome was named to command the combined forces, with Admiral Ohnishi to serve as his chief of staff.

As October ended, it was apparent that it would take more than a miracle to save Japan from impending disaster. Admiral Kurita's force, after making a successful approach to Leyte Gulf and then fortuitously getting an inferior enemy force within gunfire range, mysteriously failed to press home its attack and withdrew from the enemy. Admiral Ozawa's ships served to good purpose as a decoy force but were almost completely annihilated in the process. All available planes of the Army and Naval Air Forces had been mobilized to carry out conventional attacks on the enemy, but, like all our other efforts, this too was a failure. The invader had firmly established his bridgehead on Leyte Island by the end of the month.

It thus came about that *kamikaze* tactics were given full play, and young men volunteered freely for the opportunity to add to the intensity of the "divine wind." Reinforcements poured to the front from the homeland to crash in turn upon enemy warships. And each new pilot was as calm and composed as his predecessor.

If a pilot returned to his base unable for some reason to make an attack, he was always ready and eager to try again the next day. One such officer, a unit commander, came back to Cebu alone, having refrained from trying to crash his plane because the enemy ships had not been reached until after dark. He wrote a report to his commanding officer in which he said, "I think it advisable to launch special attacks at dawn, with Cebu as the last staging base. Please tell those who follow never to lose patience and attempt an attack under adverse conditions." Before

dawn next morning he took off alone from Cebu field to fulfill his destiny by crashing into a ship at Leyte Gulf.

Day by day the situation around Leyte Island became more desperate and hopeless. But as the tempo of the enemy invasion increased, so too did the intensity and volume of *kamikaze* attacks. One after another the brave young volunteers had planes assigned to them, made a few practice flights, and then received orders for their target and time of take-off.

Impressive, yet typical, was the performance of Lieutenant S. Kanaya, who came to the Philippines in late December as leader of the last *kamikaze* reinforcement echelon to arrive that year. Irresistible allied forces had already swept through the central Philippines and the fate of Luzon was inevitable. Kanaya's attitude was calm but completely detached, and he evinced interest in only one subject—that his plane make an effective hit. He practiced at making speedy take-offs until his timing was perfect to the split second. This was important in view of the constant threat of enemy air raids which might come at any time, often thwarting special attacks before they even got started. Every day he was first in practice, approaching his plane at a run, in full flying gear, despite the sultry Philippines weather. Each time he was asked to submit a list of names from his unit for the next attack, his name headed the list. It was not until 5 January that his chance came and he led a unit of 15 fighter-bombers in the last large-scale suicide attack upon the enemy invasion forces at Lingayen Gulf. Observers reported that one cruiser and four transports were hit and damaged.

The last *kamikaze* flights from Philippines bases had been scheduled for 5 January and the dwindling supply of planes had been allocated accordingly. That day the last operational planes took off on their missions; only remnants of damaged planes remained and they were to be destroyed.

But energetic maintenance crews worked throughout that night patching and repairing so that by early morning of 6 January, 5 extra fighter planes were ready for flight. The base commander had the difficult task of selecting 5 pilots from the more than 30 who remained, all having volunteered for this final special attack from a Philippines base. The men selected showed their gratitude at having been thus honored by saluting solemnly as they taxied past the commander for take-off. They circled the field once before disappearing into the sky.

Further Japanese defeats followed quickly after the fall of the Philippines. The mighty enemy invaded Iwo Jima in February and Okinawa in April, trapping Japan in a death grip which inspired desperation tactics on an unprecedented scale. The decision was made to throw every possible plane into repelling the enemy at Okinawa. Convinced that *kamikaze* attacks were the only means at their command which might prove effective against so powerful an enemy, headquarters ordered that they be exploited to the fullest extent. Even training planes were mobilized.

Divine Thunderbolt Unit

A new suicide weapon was introduced in 1945 consisting of a rocket-powered 3,960-pound missile. It was attached to a "mother" bomber for delivery to within sight of a target. There it would be released and a volunteer suicide pilot would fly it in to crash an enemy ship. This ingenious device was developed and promoted by a naval aviator who had been organizing and training a special unit since September 1944. This group was called *Jinrai Butai* (divine thunderbolt unit), but *Baka* (foolish) *Bomb* was the notorious nickname it earned among the allies.

This weapon was first employed in battle on 21 March when an enemy task force built around 3 carriers was sighted 320 miles from the southeastern tip of Kyushu. A flight of 18 medium bombers, all but 2

carrying human bombs, was reluctantly ordered to attack by Vice Admiral Ugaki, who, as Commander in Chief, 5th Air Fleet, was in charge of air operations for the area. Ugaki hesitated about ordering this attack because of the scarcity of fighter planes to act as escorts. His doubts proved to be well-founded when this unit was ambushed and completely destroyed by a vastly superior group of enemy fighters, 50 miles short of the task force position.

One of the largest air attacks against the invaders at Okinawa was made on 12 April. Some *Baka Bombs* were used in this attack, and one of them scored the first hit for this type of weapon. The successful pilot napped peacefully during the flight toward Okinawa and had to be awakened when the time came to board his flight to eternity. Upon release from the mother ship, the bomb sped down and away at great speed, soon disappearing from sight of the bomber crew. The big plane had turned and was heading back to base when, after several minutes of anxiety, her crew was relieved to see a huge column of black smoke reaching skyward—silent evidence that a "divine thunderbolt" had found its mark.

There were a few volunteers who tended to become morose during the wait for their call to action. Especially was this true during the Okinawa campaign in which there were more than 1,800 special attack flights and pilots, requiring involved planning and causing extended delays in many cases. By the time of Japan's surrender, a total of 2,519 men and officers of the Navy had futilely sacrificed themselves in the mad eddy of the "divine wind." This does not include volunteer suicide Army pilots, nor does it include a small group of Naval pilots who took off on suicide flights but were not counted as *kamikaze* attacks because their sortie was made after the Imperial rescript proclamation of 15 August 1945, calling for immediate cessation of the war.

At noon of that day the Emperor's voice had gone out to his people by radio with the words of the rescript, an event without precedent in Japan's history. A few hours later the 5th Air Fleet Commander, Admiral Ugaki spoke to his assembled officers and men.

Our Air Fleet has long been of the conviction that every man would fight to the finish, but we have come to a sorry day. I am going to take off for a crash attack upon the enemy at Okinawa. Those who wish to follow me are requested to raise their hands.

Sensing the imminent surrender, Ugaki had determined early that morning to die crashing an enemy ship at Okinawa, where he had sent so many pilots to their death in suicide attacks. He ordered his staff duty officer to prepare dive bombers for the take-off. Close friends and members of his staff tried to dissuade the Admiral from his plan, but, true to his reputation for imperturbability, his blunt answer was that he "must have a place to die."

Cautious and thorough as ever, Admiral Ugaki stripped the insignia of rank from his uniform, and carried only a short samurai sword. His enthusiastic pilots responded eagerly to the Admiral's query about followers. There were more volunteers than there were planes available to follow the commander. The 11 planes finally took off and, although 4 of them were forced to drop out or turn back along

the way, 7 planes, including Admiral Ugaki's, sent back their "time of diving on target."

Japan's surrender found another sponsor of the *kamikaze* corps in the important post of vice chief of the Naval General Staff in Tokyo. Admiral Ohnishi had been ordered to Formosa when the fall of the Philippines appeared inevitable in early January and remained there until ordered to Tokyo in June. On 15 August came the proclamation of Japan's surrender and that evening Ohnishi summoned staff officers to his official residence for a discussion which lasted late into the night. On their departure he penned a note:

To the souls of my late subordinates I express the greatest appreciation for their valiant deeds. In death I wish to apologize to the souls of these brave men and their families.

Upon completing this last testament in the early morning of the 16th, he plunged a samurai sword into one side of his abdomen and drew it across to the other in complete satisfaction of the *harakiri* tradition. When told of this, his secretary rushed to the dying man, only to be ordered, "Do not try to help me." Thus, refusing both medical aid and a *coup de grâce*, he lingered on in agony until 1800 that evening. His choice to endure prolonged suffering was obviously made in expiation for his part in the most diabolical tactic of war the world has ever seen.

India's Wartime Effort

Digested by the MILITARY REVIEW from an article by Lieutenant General Sir Wilfrid Lindsell in "The Journal of the Royal Artillery" (Great Britain) July 1953.

IN THE light of the tremendous happenings of the war in Europe, in Africa, and in the Pacific, few people, other than those immediately concerned, had the time or the inclination to study closely the extent of India's contribution to the allied effort which culminated in the defeat of Germany and Japan. Yet both in manpower and in

material resources, India's contribution was a major factor in the defeat of the Axis powers. One speaks, of course, of India under British rule and before partition and it would be well to consider what might be the contribution of the new India and Pakistan in the event of any future world conflict in which Great Britain and

the Commonwealth may become involved.

The declaration of war in 1939 automatically involved a United India under British rule in the conflict. In any future world war the new India and Pakistan will be free to decide for themselves what part they wish to take or whether to endeavor to remain neutral. Should they decide, and be able to maintain a neutral attitude, how would the contribution that was India's between 1939 and 1945 be made good in the changed circumstances by the Empire at war?

In order fully to appreciate India's achievement in World War II it is necessary to have some picture of the economic, geographic and historic background which produced the basic conditions against which India's effort was developed.

India's Background

In round numbers India has a population of four hundred million. This population is nearly 90 percent agricultural, it is largely illiterate, it lives to a great extent very little above subsistence level, and it is spread over a continent very inadequately provided with communications. Farming methods are incredibly primitive and her soil drained of its natural fertility, means that India can only support about half her population on her own indigenous production. An annual birth rate of nearly 5 million aggravates the problem. Recurrent famine conditions add to the difficulties. It is believed that in the famine of 1943 more than 3 million persons died of starvation.

In India, twenty times the size of Great Britain, there are only seven ports worthy of the name. There are only 1,000 more miles of railway track than in the United Kingdom, and upon this railway system, during the war years, there were only one-third the number of engines and one-sixth the number of cars that are normally in use on the railways of England.

It is in the light of this general eco-

nomic background and against these primitive conditions, by European standards, that India's stupendous wartime effort must be judged.

Historically, and up to the time of Japan's entry into the war, India has always been faced by one overriding military problem—the threat of invasion across the northwestern frontier. In the period 1939-41 this threat was still a very real one. In those early days of the war nobody knew on which side the Soviet Union intended to fight, and later German penetration into the Soviet Union, almost to the Caucasus, produced a fresh lot of problems in Iraq, Iran and Afghanistan and in the territories bordering on India.

Military Establishment

In view of this historical background, the organization and layout of India's military defensive system, notably in the administrative sphere, had been developed with a western orientation, quite unsuitable for meeting the needs of a military threat by Japan coming from the east. With Japan's entry into the war, India had to turn about and face eastward and re-orient her entire military and air force organization to provide a system of defense for her eastern frontier and for the maintenance of her forces in Assam, Burma and beyond.

Prior to the outbreak of war in 1939, India's peacetime Army consisted of about 225,000 men including British, Indian and Gurkha troops and civilians and non-combatants serving with the Army. The Indian troops were recruited mainly from the north—they came from the small-farmer class and had very little education. This Indian Army was largely unmechanized, and although plans for mechanization existed, neither the necessary vehicles nor equipment were available at that time. Because 90 percent of the population lived on the land, there were available for recruitment very small numbers of men with any

mechanical training or with a mechanical turn of mind. The officer element was largely from the United Kingdom, although Indians were being trained to replace British officers in the Indian Army.

As the Indian Army expanded, it was found that the prewar classes could not provide the numbers of soldiers required, so we had to enlist new classes from all over India. This led to new problems of language as in the vast area of India there are many different languages and dialects, as different from one another as Russian is from Spanish. These general conditions affecting the Army in India and its wartime expansion applied also to the Royal Indian Navy and the Indian Air Force. The total strength of the Royal Indian Navy prior to the war was about 1,500 men which was rapidly expanded to 25,000 men. The expansion of the Indian Air Force although it started later was of similar extent, and both forces made notable contributions to Indian's war effort.

This describes the extent of the armed forces in India on the outbreak of war. The expansion was rapid, and in the light of all the relevant circumstances constituted a truly remarkable achievement. By the end of 1943 the 2 million mark was reached and was maintained until peace came in September 1945. The steps in Army expansion are interesting. In the spring of 1940 it was decided to raise a field army of one armored and five infantry divisions and by the end of 1940, the Army in India had over 400,000 men.

Military Expansion

In 1941, not only was Afghanistan still threatened, but there was now the added threat by Japan, and demands for troops for overseas theaters were considerably increased. Toward these last requests, India offered the British Government by the end of 1942 four infantry divisions and one armored division subject to the equipment being available and to certain British per-

sonnel being provided by the United Kingdom. By the end of 1941 the Army was about 900,000 strong.

The plan for 1943 contemplated five more infantry divisions and a third armored division, but Japan's entry into the war upset these plans and by now there was a serious shortage of British officers. Yet in spite of increasing difficulties, an overall figure of 1,675,000 men was reached by the end of 1942.

The changes brought about by Japan's penetration into Burma and the threat to India which was developing called for some changes in the expansion plans for 1943 and it became necessary to concentrate more on the raising of administrative troops and services for the development and working of the Assam line of communications and Eastern Bengal, upon which the supply and maintenance of our forces operating in Burma depended as well as the supply to China by air. This latter service was carried out by the United States Air Force but their needs and the requirements of China placed an excessive call on the capacity of the Assam line of communications. The maximum capacity of this line of communications in 1943 was 3,000 tons a day, but mainly as the result of the efforts of the Army's administrative services and the practical help of the United States railway troops, this capacity was increased to 9,000 tons a day by January 1945. The Indian Army's expansion to meet these and similar needs, largely of an administrative nature, brought the total figure of recruitment to the 2 million mark by the end of 1943, at which figure it was maintained.

Comparisons are generally to be deprecated, but when such tremendous efforts were being made throughout the Empire, it is worthy of note that by the end of 1941 there were more divisions from India serving in theaters of active operations than from any other part of the British Empire including the United Kingdom.

Employment of Indian Forces

In the early days of the war, in 1940, units of the Indian Army were deployed in Egypt and also in Europe and in Norway. By the end of 1941, India had two divisions in the Middle East and the best part of two divisions in Malaya. An additional $3\frac{1}{2}$ divisions went to Iraq and Iran; they saved those countries from the Axis powers and secured the lines of communication to the Middle East and later the supply route to the Soviet Union through Iran. The splendid part played by the 4th and 5th Indian Divisions in the early victories in Cyrenaica and Libya; in the re-conquest of Abyssinia and in the final campaign in North Africa and Tunisia were well known. The quelling of rebellion in Iraq and the stabilization of Iran were the work of the Indian Army. The two Indian divisions in Malaya were ill-starred as were all the troops that took part in that campaign. Indian Army formations played a major part in the Italian campaign in 1943-44.

The Fourteenth Army which effected the re-conquest of Burma, provided a magnificent page in the history of the Indian Army and drove the Japanese from their last footing in the British Empire. So from Norway to Singapore there was no theater of active operations in which the Indian Army did not play a part. A small sideline to the services rendered by India is to be found in the epic story of the evacuation from Burma in 1942. The wonderful work of the tea plantation labor of Assam, organized by the planters themselves, in rescuing and succoring the evacuees through what is probably the most difficult country in the world, is a never to be forgotten story. This same labor force played a great part in the building of three great roads which were thrust into Burma for the succoring of China and the maintenance services of the Fourteenth Army.

In addition to the fighting forces that India sent overseas, she also sent in 1939 and 1940 her railways—that is the railway

track, engines and cars. This was mainly meter gauge plant and it went to supplement the lines of communication in Iraq and some of it to Egypt. India also sent her river craft from the Ganges and the Brahmaputra. The North African Western Desert line which maintained the Eighth Army was built partly by material from India. The Iraq railway system and the Tigris River line of communications were greatly helped by Indian equipment. When, later, the development of the Assam line of communications became a matter of urgency, India felt seriously the loss of river and railway equipment which she had so generously supplied earlier in the war and which she was unable to get back.

Munition Supplies and Equipment

There is yet another sphere in which India's contribution to the allied effort was of immense importance—the sphere of munition supplies and equipment. Should India's contribution in this sphere not be available for any reason in the event of any future major world conflict, it is difficult to say today from what other source the loss could be made good.

In considering India's contribution in these connections, it is necessary to remind ourselves that India is primarily an agricultural as opposed to an industrial country, and that her population lives on the barest margin over a subsistence level, not only as regards food, but also in all the normal necessities of life—textile goods, coal and transportation facilities. When the barest living standards have been met, India normally has no margin for contingencies, or to meet the excess demands of war. Any reduction in certain types of consumer goods would necessarily lead to a reduction in the standard of living below the subsistence level and cause excessive rise in prices or produce famine conditions. In highly developed Western countries such as the United Kingdom, it is possible to control prices and prevent undue rises

in spite of big reductions in consumer goods. In India, a certain measure of control was possible in the big towns, but it is quite impossible to exercise control over the vast area of India with its great distances and large tracts of undeveloped but often heavily populated country. Any industrial expansion to meet an increased wartime demand had to be implemented with the greatest care, and in every form of development during the war the shortages of coal, of food, and of transportation facilities were dominating factors in what it was possible to produce. In all plans for industrial development and expansion, it was essential to ensure that the demands made on India did not deprive her people of the essential standards of living. Despite these difficulties and disabilities, India developed some of her major industries which, in their own particular line, constituted a main source of supply within the Empire.

Jute, shellac, manganese, textiles, coal, steel, mica, are only a few of the many materials which India contributed to the war effort of the allies. From time to time and often in critical periods, India was able to fill the gaps in the munitions supply of various overseas theaters such as Iraq, the Middle East and Italy, but always under conditions of great strain to her own economy.

The Jute Industry

Calcutta and Dundee, with the latter a very poor second, are the world's two greatest manufacturing areas of jute products. While the Indian jute industry enjoys a virtual monopoly of the manufacturing end of the industry, its monopoly of the raw material is absolute. Raw jute fabric grows only in India in spite of attempts to cultivate it in Brazil, Japan and East Africa. The Empire's war requirements of jute products were, therefore, almost entirely met by Indian raw jute and from the production of her mills.

During the war years, the Bengal mills alone turned out, among other things, 93 million sandbags a month, while the Empire's needs in hessian, camouflage garnish and nets, and grain bags were largely provided by India. During the war years, the average annual production of the Indian jute mills was 3 billion yards of cloth of all kinds, including 70 million yards of hessian for the United States.

The Textile Industry

Half a million workers contribute to the Indian textile industry. This is considerable when we remember that the textile workers of the world number about 14 million. Cotton cloth—khaki drill and shirting material—and tentage were the chief wartime products of the industry. The production was some $6\frac{1}{2}$ billion yards a year, of which a minimum of almost 5 billion was required for civilian consumption in India; this allocation allowed only 12 yards per head per annum for the population which represented a considerable curtailment of the normal peacetime allowance which worked out at 20 yards per head. Almost 1 billion yards were supplied to the government for war purposes and the balance went for export.

India was in a unique position regarding the manufacture of tentage, as she was by far the largest Empire producer. Orders for tents amounting to over 40 million dollars were placed in the year 1942-43 alone. Even then India could not meet the colossal demands of the Empire and United States forces.

India is practically the sole producer of mica and large quantities were supplied to the Empire and allied countries for the manufacture of electrical equipment. For this and other industrial production work, there was, during the war years, a serious shortage of skilled labor. This shortage was universal, and the Government of India therefore set up a scheme for training. Arrangements were established for

training simultaneously some 50,000 workers in a variety of skilled trades.

In the sphere which is more normally understood by the term munitions, India set up 17 ordnance factories, 9 clothing factories, 2 harness and saddlery factories and 2 parachute factories. These factories, supplemented by the trade, turned out 3.7-inch howitzers, light machine guns, optical instruments, rifles, and all types of small arms ammunition, as well as ammunition for 25-pounder guns and 3.7-inch howitzers. Armored fighting vehicles, hand grenades and shell bodies were also produced in large quantities by the Indian railway workshops. India did not produce sufficient quantities to make her self-supporting in these technical items of munition supply, but the amounts produced represented a very material assistance to the Empire's war production.

Conclusion

Enough has been said to show what an immense contribution India made from 1939 to 1945. Should India and Pakistan stand apart from any future world conflict, a new set of problems is produced both in the sphere of fighting manpower and in munitions supply.

Today with the Kashmir problem still

unsettled and the frightful slaughter of the early days of partition still fresh in the minds of both peoples, India and Pakistan exist in a state of armed neutrality, still glaring at one another across artificial and indefensible frontiers. So long as such a state exists, it is idle to suppose that either country would send its soldiers overseas to share in the Empire's battles. Nor would they be in a position to direct their energies to munitions provision outside the normal trade levels and such trade might not be available if an attitude of strict neutrality was attempted.

India has already shown, by her praiseworthy and statesman-like efforts in the councils of the United Nations, to find a solution for the Korean armistice deadlock, that she can play the part of benevolent neutral in the squabbles of the other nations of the world, and this is the role that she will undoubtedly endeavor to stick to in the future.

Pakistan too, may be expected to hold similar views. As a leading Moslem power, Pakistan will be much concerned by the attitude of other Moslem powers who may be involved in the world's future wars, but for the time being at any rate, her first concern and interest will be dominated by her position *vis-a-vis* India.

Technique of Night Fighting

Digested by the MILITARY REVIEW from an article by Major
A. Seaton in "The Army Quarterly" (Great Britain) July 1953.

CIVILIZATION in Europe brought with it the development of the art of war. Armed forces became larger and fought as disciplined units. The difficulty of control was recognized, and for this reason battles were fought during the hours of daylight; night action being restricted to ambushes and minor raids. This disinclination to engage in night fighting became even more marked with the introduction of firearms,

since fire power came to play as great a part as shock action in forcing a decision in battle, and for this daylight was an essential.

Most of the great military commanders of the eighteenth and nineteenth centuries were unanimous in their condemnation of night fighting. Frederick the Great stated his resolve never to undertake any fighting by night, because of the resultant confu-

sion and the deterioration of discipline experienced when officers could no longer see their troops.

Napoleon said that night operations depended for success on a dog or a goose, and pointed out that although such operations were sometimes successful, more often they were doomed to failure. Blücher declared that he feared night operations more than enemy bullets, while Jomini even advocated against movement by night.

Notwithstanding the reluctance of commanders to undertake night fighting, the history of campaigns does afford some examples of successful night operations. At Hochkirch, in 1758, an Austrian army under Marshal Daun attacked Frederick the Great by night, inflicting on him 10,000 casualties and the loss of all his artillery and supplies. At Laon, in 1814, York's Prussian Corps delivered a bayonet assault on the French, and for the loss of only 500 men, killed 1,500 and took 2,500 prisoners, and captured all the French artillery and supplies. At 2100 in the evening of the day of Waterloo, Wellington and Blücher jointly decided that the pursuit of the French should continue throughout the night. Other such examples do exist, but they are relatively rare, and more often than not, the undertaking of night operations achieved little but disorder and heavy casualties.

Clausewitz in his teaching stressed that night attacks should be undertaken but infrequently, and only by limited numbers of troops. In the Prussian view this doctrine was confirmed by their experiences in the campaigns of 1866 and 1870, when large-scale operations by night, such as the attack by the Prussian 2d Corps on the Point du Jour, achieved nothing.

The Russo-Japanese War

Unlike the armies of Western Europe, the Czarist Imperial armies had shown a marked aptitude for night fighting, and the majority of Russian commanders certainly did not share Clausewitz's views on

limited night operations. In 1794, Suvorov, with a force of 25,000 Russians, launched a night attack on a large Polish force holding Praga near Warsaw. The attack was successful and some 12,000 Poles were killed or captured. Again, in 1878, the Russians made a night attack on the strongly held Turkish fortifications at Kars. For the loss of only 487 dead and 1,785 wounded, they captured 17,000 prisoners, over 300 guns and about 25,000 rifles.

The Japanese Army, organized and trained by German instructors, entered the Russo-Japanese War. Like their German mentors, the Japanese were disinclined to undertake any but the most limited night operations, however, the excellence of the Czarist artillery and the Russian superiority in fire power and numbers soon forced them to the conclusion, that their only salvation lay in night fighting. They thereupon evolved their own night fighting technique based on a study of Russian methods and modified it according to their own experience. This technique was so perfected that they themselves were soon able to launch large-scale, silent attacks on dark, moonless nights, sometimes—as at San-Kwai-Seki-San—using no less than 23 battalions in a single attack.

The end of the Russo-Japanese War left the Japanese Army as the most formidable night fighting force in the world, and the lessons it learned were never allowed to be forgotten in the subsequent two world wars.

The Two World Wars

The night fighting in the Russo-Japanese War aroused great interest in Europe, particularly in Great Britain and Germany, and in both the British and German Armies some emphasis was laid on night fighting training in the years before 1914. Both Armies concentrated on night patrolling, but both were unanimous in their rejection of large-scale night attacks. During this period, the British became particularly adept in rapid night movement, but

they generally preferred dawn or dusk attacks to the night assault.

The British and the Germans entered World War II with unchanged views on night fighting. It was recognized that the test of the trained soldier was his ability to operate by night, but commanders showed reluctance when it came to attempting large-scale operations in darkness.

The British commenced night fighting in attacks on the Italians in the Western Desert, but very few troops were used in these operations. Later in the war, it became common for formation attacks of up to corps strength to be mounted at night, particularly when obstacles had to be overcome.

Unless use was made of movement light, these attacks had to be timed with the phases of the moon, and in nearly all cases, such operations were noisy attacks, direction being maintained by visible aids such as a barrage and the firing of tracer ammunition. Large-scale, silent attacks in really dark conditions—of the type used by the Japanese and Russians—were never considered to be practicable.

Although the Japanese continued to stress the value of night fighting and to prove their ability in this direction during World War II, the Soviets on the other hand neglected the art.

This defect is probably explained by the loss of the majority of the professional officers after the Mutiny of 1917, and the frequent army purges in the interwar years. In any event, the Russo-Finnish campaign of 1940-41 showed the Soviets to be decidedly inferior to the Finns in night fighting.

During the course of the Russo-German War, great efforts were made by the Soviets to bring their standard of night fighting up to its former level. It is believed, however, that they now regard night fighting as a specialist task, and train only part of each infantry battalion

for silent night attack operations. Similarly, certain battalions are earmarked for night training in order to enable them to take over sectors of the front after dark. In addition, the Soviets undertake large-scale night attacks using normal field formations. These attacks, however, are very similar to the British in pattern, requiring artillery support and being assisted by such devices as searchlights.

Present Technique Efficiency

An army's efficiency in night fighting can be judged by its ability to carry out successful night operations under really dark conditions. In general, it is quite wrong to judge night fighting efficiency on ability to carry out successful noisy attacks under conditions of real or artificial moonlight.

A high standard of night training entails the ability to move, assault, defend, and patrol silently in real darkness. This calls for highly trained commanders and staffs, and for disciplined troops who are able to see, move, and fight at night. The higher the standard of training the larger will be the scale of night operations.

It may be argued that such a standard is an ideal, not attainable, since man has not been endowed with the sight of a night animal. The Japanese proved in Manchuria that this argument is false.

By this standard, therefore, one must conclude that the standard of efficiency of night fighting is low. This is due to the fact that military thought in Europe has too long been obsessed by the teachings of the last two centuries. The lessons of the Russo-Japanese War have been largely ignored or rejected and little attempt has been made to investigate and study the night fighting ability of non-Europeans—particularly the Asiatics.

Value in Future War

In a future war the British—and their allies—are likely to be opposed by numerically superior forces. In the initial stages,

the enemy is likely to possess a measure of air and artillery superiority and possibly a greater strength in armor.

At first sight, the advantages enjoyed by the enemy might appear to be greater than they really are. Fire and air power and superiority in armor can only be exploited to the full during the hours of daylight, and history has proved that by night small, highly trained forces can cripple and sometimes destroy larger, better equipped armies. In 1200 B. C., Gideon with only 300 men routed the Midianite hosts at Moreh.

Napoleon's Grand Army was increasingly harried throughout the long winter nights by small forces of cavalry and Cossacks, with effect out of all proportion to size. In 1904, the Japanese operated most successfully by night against a stronger enemy, while in Korea, the Communists endeavored to nullify the allied superiority in air and fire power by using the same tactics.

It is essential, therefore, that the British and their allies should master the art of night fighting. This mastery must include the ability to move, patrol, defend, and assault in absolute darkness. No longer must one consider artillery support or real or artificial moonlight as a requirement of a night attack. To do so will result in the assault foundering under the heavy weight of the enemy's defensive artillery fire.

The difficulty in making a silent assault on localities well defended by obstacles is of course known. In the early stages of a future war, however, we are unlikely to be required to do so, as the emphasis will be on the mass destruction of penetrating enemy forces.

The coming of darkness will neutralize the enemy's weapon superiority, and obstacles will be virtually non-existent. This, then, is the time to deliver the assault, and the absence of moonlight will favor rather than impede the trained night fighter.

Development of New Aids

The use of searchlights in war is not—comparatively speaking—a new aid. They were used in the Russo-Japanese War and the British Army carried out trials with them before 1908. In World War II all the belligerents made use of them.

Their main function is to provide illumination by direct or reflected light, thereby facilitating tactical, working, or fighting movement. The degree of illumination varies according to weather conditions and to the number of searchlights used on a given front. On a dark, starlight night two searchlights can produce visibility approximating that of a quarter moon obscured by high clouds.

Movement light is invaluable in the set-piece attack, particularly when obstacles have to be breached. By its light, armor can be moved and used if necessary in the assault. Since, however, the degree of illumination is not sufficient to permit tanks to use aimed fire, it should always be appreciated that armor, if used in the night assault, provides moral rather than fire support. The use of armor at night when assaulting a really determined enemy, may in fact prove an embarrassment to the attacker.

The main disadvantage to the use of movement light is the forfeiture of surprise. The folly of forewarning an enemy who has marked artillery superiority has already been illustrated. In such circumstances, it is preferable to employ a silent attack in darkness.

Searchlights have, in addition, other uses, the most common of which is to indicate direction to forward troops. In Italy, the Germans used searchlights in pairs to indicate targets to night attack aircraft, and both the British and the Soviets mounted searchlights on tanks to illuminate the battlefield and provide some aid to night firing.

Radar Equipment

Although field radar equipment can detect movement many miles away, it is doubtful whether it can ever be used successfully in the forward areas. The equipment is bulky, vulnerable, and difficult to conceal, and topographical clutter would make its use impracticable. Even if these difficulties were overcome, it could, at the best, provide only an indication of enemy movement or activity.

Infrared Equipment

By the projection of an infrared beam, it is possible to see quite clearly at night for a limited distance. By using special night sights, it should be possible to produce a degree of aimed fire.

Such equipment would be, of course, invaluable to tanks and would enable them to be used effectively at night. In a compact portable form, for instance, as a night sight to a rifle, it could be put to excellent use by infantry.

On the other hand, the value of infrared equipment should not be overestimated. If the enemy is in possession of it, he will presumably be able to detect and locate our equipment as easily as the naked eye can detect the use of electric torches at night. Because of this, it may prove to be of little use.

The Basic Requirements

Success in night fighting—whatever the type of operation—depends on the following requirements:

1. Good information and reconnaissance.
2. A simple plan.
3. Detailed briefing and clear orders.
4. Thorough preparation.
5. A very high standard of individual and unit training.

In the British Army today, the importance of the first four of these requirements is well understood. It is the fifth requirement which has not been met.

Until a unit or formation is able to

move across difficult country in absolute darkness and deliver a silent assault, it is not trained for night fighting. If it can do this successfully, it will be highly proficient in patrolling and defense.

A tendency now exists in the British Army to regard attacks of this nature as the province of commandos or other specially trained troops—the standard of training of normal infantry formations being regarded as too imperfect for these tasks. The Japanese have proved that by thorough training the night fighting efficiency of infantry can be brought to this high standard quite quickly. It is in fact essential that all troops should be so trained, and that one standard should be general throughout the Army. Any proposal to create an elite corps of night fighters, by earmarking one rifle company in the battalion or one battalion in the brigade for specialist training, should be rejected because:

1. The strain and casualties of night fighting are borne by a minority, and, therefore, jealousy and dissension will result.
2. The problem of providing trained reinforcements will be difficult.
3. In a future war, one may have to commit whole brigades and even divisions to silent night operations.

Training and Selection

The burden of night fighting is borne, in the main, by the infantryman, and it is on his night fighting efficiency that the success of the operation depends. For this reason, it is with infantry training and selection that this part of the article deals. It should be remembered, however, that similar training is required by certain other arms, particularly those which are required to send technical detachments with the patrol or assault.

The aim of training should be to enable the unit and the formation to move in silence and fight in conditions of absolute

darkness. This aim will never be achieved until each and every individual soldier is a proficient night fighter. On this everything rests, and on this every effort must be concentrated.

There can be no doubt that primitive peoples have a natural ability for night fighting, because of their highly developed senses of night sight and hearing. With civilization, these senses become dull, since man no longer relies upon them for self-preservation. By careful training, however, these senses can be re-developed.

Night Vision Training

Night vision is in no way connected with ability to see in daylight. Some recruits possess it to a remarkable degree even before training, others—the relatively few night blind—will never acquire it, however long they are trained. In a series of tests conducted by Major Lee O. Rostenberg of the United States Army, it was found that some men could easily recognize an object on a very dark night from a distance of 94 yards. Others could not recognize it at 10 yards. All of these men had excellent sight by day.

It is necessary, therefore, for all army recruits to undergo tests for night vision. Those with very poor night sight should be assigned to arms other than infantry. These tests should be repeated frequently while the recruit is under training, and those who fail to make the necessary improvement should be transferred from the infantry.

Night vision training should commence as soon as the recruit has completed his basic elementary training. It must be continuous, unhurried, and thorough and must include training in scanning, off-center vision, dark adaptation, and recognition of military objects at night. As soon as it is practicable, all sub-unit training must be done at night—the day being used for rest.

The importance of the night vision

training cannot be overemphasized. In the British Army of 1952 night vision training received too little attention. Yet the Japanese training manuals of nearly 50 years ago treated it as the major factor. In the pamphlet *Night Movements*, published in 1905, the Japanese say: "In the Japanese-Russian War, the night sight of soldiers accustomed to the terrain and night operations, was surprisingly good, and was entirely due to training and experience."

Good night vision is essential to all night fighting, and no matter what scientific aids may be produced in the future, there is no substitute for the human eye for the patrol or hand-to-hand encounter. Soldiers who cannot see well at night are a hazard to their comrades and to the operation, and some cases of panic and loss of nerve are attributable to poor night sight rather than to lack of courage.

Night Hearing

Hearing is a valuable aid to night vision. At dead of night, all men can hear better than during the day, but careful training is needed in sound interpretation.

By exercises and competitions, men should be trained to detect "military" from "non-military" sounds. They should be able to recognize the sound of digging, wire cutting, the cocking of weapons, removal of bayonets, and the movement of varying numbers of men over different types of ground. They should be made to understand the effects of wind, weather, and time of night on sound.

Other Night Training

When men are trained to see and hear at night with a reasonable degree of proficiency, training should be concentrated on night movement, direction keeping, digging and wiring, and the breaching of obstacles. Emphasis must be placed, too, on training in sentry duties, patrolling, bayonet fighting, and grenade throwing at night.

The aim should be to carry out nearly all training and exercises at night, and training by day should be confined to the firing range and occasional exercises with tanks.

Conclusion

The technique of night fighting has been neglected by all military powers with the sole exception of the Japanese. It may, therefore, be said to be in its infancy.

In a future war, the British Army may be faced by an enemy stronger in manpower and initially better equipped. Its ability to defeat such an enemy may well rest on its superiority in night fighting.

An improvement in the technique of night fighting can only be attained by rigorous and thorough night training. In particular, some revolutionary changes must be made in the training of infantry.

Night training and night exercises should be the normal—exercises in daylight the abnormal. Reliance should be placed on stealth and the use of the bayonet rather than on scientific aids and on the heavy supporting fire of other arms.

Such a high standard can only be achieved by a more selective method of infantry recruiting, and by emphasis on individual night vision training. The importance of this factor—although realized by the Japanese some 50 years ago—is still only partially understood in the British Army today.

The importance of scientific aids and their effect in a future war should not be overestimated. Their use will often prejudice surprise, and, in the early stages of the next war, loss of surprise may entail the inability to close with the enemy.

Surprise--Its Present Value

Translated and digested by the MILITARY REVIEW from an article by
Major Javier de Isasi Ivison in "Ejército" (Spain) May 1953.

WE ARE at the threshold of a possible third world war. Each day the atmosphere becomes more complex and one can scarcely see how diplomacy alone will overcome the obstacles which today oppose peace among peoples.

With this latent threat of another war, the nations—some willingly and others unwillingly—are reorganizing and rearming their armed forces. We, constantly, read of the invention of new weapons or the improvement of old ones, and of the zeal with which possible opponents guard the secret of their inventions while attempting to discover true facts about the enemy's. It is clear that their aim is to be prepared at the outbreak of war so that they will have an initial advantage over their adversary. Under these circumstances, we consider it of great importance to discuss

the element of surprise in war and what its present value can be.

Before beginning our discussion on the element of surprise as a principle, we would like to point out that the principles of war are inseparably linked and complement one another in such a manner that none predominates or becomes obscure with any detriment to the others. Each contributes toward success. However, when one deals separately with the element of surprise, a glaring disparity in the order of importance inevitably results. This might be understood as a misinterpretation of the situation and one which is only a disproportion or an irregularity forced by a preferred point of view—logical result when one considers separately what is only a part of the entire drama of war: profoundly human, extraordinarily com-

plex, but nevertheless well balanced and harmonious.

Of all the principles of war, surely none is as instinctive, as primitive, as ancient, nor with such evident practical conclusions as the element of surprise. Since life is characterized by the constant struggle for survival, surprise is as old as life itself. It is not an invention of human intelligence but is rather a law of nature. Animals employ it in capturing their prey, even though the latter is weaker and deprived of the necessary means of defense. It might seem useless in this last case; even so, we see it applied in order to avoid exhaustion, to increase the aggressor's strength, and to avoid missing the kill.

Primitive man used it in his struggle for survival. Today, it exists as an essential part of all human enterprises. Because war is the highest expression of that struggle for survival, it cannot be omitted from this general law. Military writers and great leaders have constantly asserted that surprise is an essential factor of successful warfare.

The objective or aim of war is to fight the enemy and destroy or eliminate him with the minimum of forces. Without a doubt, the leader must select as his first objective the surprise of the enemy. The act of taking the enemy unaware and avoiding being surprised, is then, the norm of conduct in waging war. This action is easier said than done! Surprise permits one combatant to pounce on another without warning, to shock and paralyze him, and, when he is able to react, to force him to improvise, and drain him of all initiative. With no freedom of movement, he has no other choice but to adjust his decisions to his adversary's will.

Xenophon once said, "Whether an event is agreeable or disagreeable, the less we expect it, the more pleasure or horror we experience. There is no better example

of this than in war when we see the element of surprise filling the heartiest with terror." Later, he was quoted as saying that one must contribute "an element of the unexpected and horrible" as a means of producing surprise. To Frederick the Great, "... everything unexpected is very effective," and to Clausewitz when discussing the moral effects of surprise, "... with it, success is quadruplicated."

"Therefore, surprise in the broadest sense of the word is the means by which the enemy's moral strength is broken, and being deprived of the faculty to think, convinces him that his cause is lost." These are words of Marshal Foch.

This indubitable moral effect caused by the element of surprise, to my way of thinking, is not successful when employed on troops whose command and staff are conceived and instructed in the unblemished spirit of discipline, fulfillment of duty, valor, self abnegation, and sacrifice for one's country, as is the case with most modern armies.

There are two highly important factors which go hand in hand in obtaining the element of surprise: secrecy and speed. Both elements pave the way for surprise. The latter, in addition, enables the maximum exploitation of the advantage gained.

Secrecy

Secrecy is definitely the factor that brings the most important results. Its dreaded enemy is time. Secrecy of operational plans and of their execution is an indispensable condition in the attainment of surprise. All great generals have been overly zealous regarding their plans. Frederick II used to say, "I would throw my nightcap into the fire if I thought it knew my thoughts." Napoleon never confided in any of his marshals, and his maxim was, "When at war, the most important factor to a commanding general, is to keep his plan a secret."

Secrecy is becoming increasingly dif-

feult to maintain. More and more sources of information—supported by the progress being made in the field of science—are opposed to secrecy. The result is a struggle between information and secrecy, similar to the age-old argument concerning guns and armor.

The concentration of combat power, its movement, transportation and maintenance in every detail, is each day more difficult to conceal, particularly against aerial reconnaissance. Special devices are able to intercept telegraph, wireless, and telephone messages within certain ranges; radiogoniometers can locate radio stations; and radar is a decisive element against tactical surprise, particularly by air or sea. Code does not guarantee absolute secrecy since there are specialists in all systems who are able to decipher almost any message, which necessitates a constant change of codes. If one adds to this, the guilty indiscretions committed by those who draw up the plans and orders, the ones who conceive and write them, and the command channels through which they must pass, then it is understandable why secrecy is both difficult and necessary to maintain.

Speed, similarly, paves the way for surprise and enables decisive results. Swiftiness in concept and decision, speed in the concentration of combat power, speed in the execution of the attack—all are indispensable conditions in the attainment of surprise.

According to Napoleon there are three requisites to waging war: "Speed, speed, and speed," and he further stated, "that the art of war lies in fearless and swift offensive action." In this way, speed became one of the most important characteristics of the Napoleonic Wars.

The campaign of 1800 in Italy, which gave France possession of almost all the Italian peninsula, lasted only 29 days.

In the year 1805, when Napoleon learned that Austria and Russia, who had not yet

broken diplomatic relations with France, were preparing for war, he gave up his plan to invade England. Secretly, he transferred *la Grand Armée*—organized and trained on the coasts of the English Channel—to the Rhine in slightly more than a month, and surprised the scattered Austrian forces at Ulm, who were waiting for the Russians to join them, delivering them a shattering blow. Approximately 60,000 men were taken prisoner.

The necessity for rapidity of movement and the problem of increasing the speed in the transport of units is an old one. These problems, considering the influence that the transportation of troops has in operations of a strategic nature, could only be resolved when the locomotive and the motor made possible the transfer of large units over great distances.

The so-called *blitzkrieg* which reached its culmination at the beginning of World War II, was only the expression of that constant demand for speed which is felt in war time. Surprise alone is not enough. One must, furthermore, deal the enemy such a decisive blow that he cannot rally or counterattack. To accomplish this, one must act swiftly, without rest, and without a cessation of hostilities. Thus, speed reaps the harvest of surprise by enabling deep and smashing penetrations in the enemy's rear, communications systems, and vital centers.

Characteristics of Surprise

Encompassing all of the activities directed toward the art of war, the element of surprise affects many zones of action—from the basic unit to the Commander in Chief, and even to higher echelons such as the governing body directing the nation's politics. Actually, the element of surprise involves two phases: the preparation and the execution. Preparation pertains to the organic and technical field. Execution pertains to the strategic and tactical field.

The element of surprise is obtained in the technical field by the use of weapons, operating procedure, and destructive measures which are unknown to the enemy and which should appear on the battlefield with no previous warning or preparation—be it at the beginning of hostilities or during the course of operations.

World War I offers a good example of this with the introduction of new methods for waging war in trenches, asphyxiating gases, super-caliber guns, and tanks; while World War II brought the atom bomb.

If initial surprise is to be more effective, combat methods and weapons must be studied, experimented with, and improved during times of peace with utmost secrecy.

The newly improved armament must be accumulated in great quantities for the purpose of mass utilization. Furthermore, we must be prepared to protect ourselves against these devices, for once having seized the invention, the enemy will turn it against us. Fortunately, this did not occur in World War I when gases were used for the first time.

Technical surprise may also be achieved by the mass employment of known weapons such as occurred in World War II with tanks and airplanes. In the technical field, surprise is a factor of great importance in an offensive war because it permits a combatant to achieve the initiative in operations which can bring decisive results.

Organic Surprise

Organic surprise can be achieved by units—such as parachute, airborne, motorized, armored, or other combat groups—which are specially organized and trained for unusual or special missions. Such was the case in 1914, when Germany employed her reserve units in the front lines in offensive operations. This employment made it possible to envelop the French left flank in Belgium. Although the initial success was not properly exploited by the

Germans, it resulted in the loss of French initiative.

This surprise was of little significance from a strategic viewpoint when compared with the strategic surprise that the National-Socialist Revolution afforded the enemy with its exemplary army of work and production. During the war, this work and production army went into action in the rear lines of the fighting forces after it had previously furnished them with the most perfect armament in the world.

Another surprise of this type was in store on a higher echelon: the presence from the very beginning of Germany's total mechanized war potential—later we were to find out that it was not an integral mobilization—in spite of the fact the enemy had been under the impression Germany needed a few months to concentrate these forces. The strategic-military surprise in the form of mass concentration represented a great catastrophe to the enemy as a result of sweeping German superiority on all battle fronts. Because of superior combat power, the Germans were able to effect far-reaching strategic maneuvers in the form of daring campaigns.

Relegating it more within the preparatory phase of war without necessarily excluding it from the executionary, we finally come to the element of surprise provided by the political labor of governments when war is imminent. The purpose of political surprise is to create an initial situation favorable to strategic plans. A mute war is waged in diplomatic legation offices even before the first cannon roars. Defeat or success often depends upon the outcome of such conferences. Politics serve as a general front in the field of great strategy with similarly related tasks as those undertaken by the Army's vanguard: to accurately determine the enemy's strength and intentions, conceal their own, and at the same time ensure the bulk of the forces—in this case, the na-

tion's total armed forces—a vantage point on the battlefield.

A fitting example of this type of surprise was the signing of the Russo-German Pact in August 1939, just a few days after war was declared. It was kept with such great secrecy by the participating nations that it surprised the allied military commissions, then engaged in dealings at the conference tables in the Soviet Union, negotiating alliances with that nation. With the signing of the treaty, Germany destroyed the allies' plans of encirclement, made all aid to Poland impossible, and saving her combat strength to deal western Europe a decisive blow, ensured her armies of the necessary favorable conditions for the successful development of her strategic plans.

Execution

Tactical surprise has been described as "surprise by troops." The element of surprise in the field of tactics involves substantial changes in the conduct of war ensuing from tactical doctrines under public jurisdiction. These changes are closely related to the newly developed scientific and technical methods.

As we have previously stated, the element of surprise is best obtained when it involves the least time and space, even if efficiency opposes taking advantage of these opportunities. Artillery preparations of short duration, when it is customary for them to last several days, or even the abolishing of these preparations when attacking with tanks, are examples of how tactical surprise was obtained in its day. Strategic surprise is called the surprise of command. It can be obtained at the beginning of hostilities by going into action with an advantage in armament or with a deployment of a superior force in power, control, and speed over any other deployment which the enemy might utilize. The fate of the German Reserves in 1914 and of the great armored units in their

initial appearance and form of employment in World War II, are the result of organic surprise. It is more difficult to obtain during the course of operations because a new strategic situation will be linked necessarily to a previous situation and can only maneuver progressively.

The increased radius of action of aircraft trained for deep reconnaissance and well-equipped to report on troop concentrations several days ahead, makes the attainment of this type of surprise difficult. However, there is a possibility of obtaining strategic surprise by using a more extended deployment, which creates uncertainty over the forces' point of attack, and enables—through the skillful exploitation of rapid means of transportation—their concentration on the precise spot of attack, without allowing for the necessary preparation to oppose the maneuver.

Strategic surprise finds its most appropriate field in mobile warfare and in fronts which are not continuous. Decision and force of command, boldness, secrecy, and speed are the decisive factors in its obtaining it.

Historical Examples

It would be impossible, if not a vain and useless task, to try to enumerate incidents either in a battle or in the course of an entire campaign in which surprise produced decisive effects. The concept of surprising the enemy is so inherent with war that one can say that there is no action in which it has not been sought, nor a decisive battle in which it has not contributed largely to success. Conflict and surprise are words always found together in history.

In the Third Century A. D., Hannibal—already lord and master of the Po River Valley—was in triumphant march toward Rome which was to culminate in the Battle of Cannae. Rome had quickly sent out Flaminius and Servilius—each at the head of an army—to block Hannibal's

path. Hannibal had decided to engage them separately in battle. By means of a skillful threat to their communications system, he lured Flaminius to the narrow Valley of Trasimeno, the heights of which he had previously occupied by a swift and secret march. Falling on the enemy forces in a surprise attack, he rendered them a staggering defeat. Flaminius with half of his followers—15,000 in number—perished. The remainder of his force was taken prisoner. Hannibal then annihilated Servilius' army which came to the aid of Flaminius too late. These two victories thus opened the road to Rome.

With a gigantic leap of more than 20 centuries, we see how Frederick the Great of Prussia and Napoleon—two proponents of the element of surprise—used methods not unlike Hannibal's. Frederick's oblique order—that of concealment on the ground—and energetic maneuvers always surprised and astonished the enemy. He defeated the Austrians in the decisive battle of Leuthen, a few days after overpowering the allies at Rossbach. Later at Liegnitz, through a change of position which was carried out during the night, he fell upon Landon, who suffered the loss of 70 guns and 10,000 men.

We have seen Napoleon in the Battle of Ulm victorious over the forces of General Mack of Austria, by preventing the Russians from joining forces with the Austrians. Napoleon did not concede easily to his generals' request for reserves nor did he become easily disturbed over reverses or progress. Yet, at the end of the day when he considered that his war-weary opponent had used the greatest part of his armament and strength, he would gather the remainder of his reserve troops to launch an all-out mass offensive of infantry, cavalry, or artillery divisions. Catching the enemy unprepared created what Napoleon termed "an event" and almost always led to victory. He obtained the element of surprise in Austerlitz in a

breakthrough maneuver of the Russian front because the Russians were led to believe that the French were withdrawing. Jena and many other decisive battles changed the contour of European frontiers, converting kingdoms into provinces, and emperors into subjects.

World War I

We continue through the annals of history to a new era—World War I. This war was entirely different from other wars. No longer were tens or hundreds of thousands of men to fight on the battle front. No longer were their triumphs or defeats to decide their country's destiny. Instead, all the facilities of an entire nation participated in the conflict. Because of its origin and purpose, it might well have been called an economic war for truly, economy was the principal factor which determined the ultimate turn of events.

In spite of this change we have seen how surprise occurred and was the organic and initial strategy which greatly influenced the outcome of early battles which left their mark throughout the war; and how the lack of power and decision in the German right wing frustrated the effects of that initial surprise. The results are apparent in the mutual collapse of both adversaries in the matter of a few days, and the forced abandonment of mobile warfare.

A crisis occurred among the principles of war and vary particularly upon the principle of surprise. An issue was made of the importance of the superiority in matériel which enabled formidable frontal engagements in which armament was all-important with fantastic artillery preparations which lasted for several days and excluded the effect of surprise, and thus permitted the enemy to rush his reserves to the threatened zone and to organize a second front. This action on the part of the enemy invariably slowed the conflict and destroyed hopes of a rupture of his lines.

The crisis continued until 1917 with only a fleeting respite in the spring of 1915, when the Germans employed gases with complete success. The fact that the Germans did not further exploit this technical and tactical surprise and that the allies swiftly adjusted themselves to the new method of warfare and quickly introduced a mask as a protective measure against these gases, returned the contenders to positions of equality.

Battle ground equilibrium was not broken until the Germans obtained tactical and strategic surprise, first at Riga and then at Caporetto, principally because of the utmost secrecy, short duration, and heavy concentrations in the artillery preparations. With the appearance of the tanks, the latter was given a staggering blow by the allies at Cambrai.

The principles of war were again restored when new methods of rupturing enemy lines were developed. Actually, all attacks following the Battle of Cambrai accomplished it. That year the Germans executed several ruptures in the Allied front followed by frequent advances of many miles. In turn, the allies did equally as well in the counteroffensive under Foch. Nevertheless, the allies were able to offer new resistance, sooner or later, and with their reserves organized, and occupying positions, they were able to halt the enemy.

And if power and the element of surprise were present in the initial phase of battle—the breakthrough, there was an astounding lack of competent means for exploitation and pursuit. The tanks were incapable of the speed which, as a complement to surprise, could produce victory.

World War II

The resounding victories of the *Wehrmacht* in the campaign against Poland; the epic assault upon Norway, the most daring operation recorded in history; the permanent rupture of fortification lines on the Western Front; the defeat

and capitulation of the Belgian and French Armies in a little over one month—all are events which captured the admiration of the entire world and resulted in the most varied hypothesis regarding the means and tactics employed to carry the war through to such decisive results.

The vivid imagination of some people led to their acceptance of the existence and application of secret war devices, unknown before, and which were in harmony with the traditional progress of the potential German industry.

But it was not in this fantastic field of new developments—which revolutionized the principles of war, halted transportation, paralyzed the use of weapons, and robbed the soldiers of their will to fight—where one must seek the answers for these, to all appearances, unexplainable victories. The reasons sought lay in the permanence of these principles, and in the prominence which one of these principles gained, thanks to the development and perfecting of weapons, the careful instruction of personnel, and the different modes of procedure put into practice.

If we tried to make a short resume of the reasons and foundations for such brilliant successes, we could do so as follows: surprise, speed, audacity, and co-operation. First and foremost, surprise in the preparation and procedure of the attack; then speed, audacity and co-operation in its execution. We have an example in the preparation and procedure of an attack, when we recall the extraordinary influential role that the political surprise of the Russo-German Pact and the organic surprise in the preparation of Germany for war played in the development of operations.

An example of strategic surprise in the execution of an attack is found in the introduction on the battlefield of great armored units supported by massed aircraft in their daring penetrations. The airplane, with the necessary power and

speed, furnished the means which made these penetrations possible. These two requisites were sadly lacking at the end of World War I in the exploitation of the advantage gained by the breakthrough.

The German *Wehrmacht* was organized along the lines of total exploitation. To exploit success again and again; to move swiftly and courageously, without even a temporary cessation of hostilities—in order to keep the enemy engaged and with no opportunity to strengthen his forces; to battle right up to his rear lines and vital centers; to disorganize and defeat him completely. This was the basic German doctrine which made Schlieffen's dream a reality—the surrender in mass of total armies first in Poland, then France, and later in the Soviet Union.

The Germans made use of strategic surprise when they employed parachute units and airborne troops to seal the fate of Holland within a few days. They wrote a similar tragedy on the pages of Norwegian history, and later were the authors of the action in Crete which stands unequalled in all history.

These things were accomplished by surprise based on secrecy and on better intelligence than the enemy's—a surprise which was based on speed such as we saw demonstrated in the occupation of the most important geographical points of the Norwegian coastline. One glance toward the Pacific will amplify Pearl Harbor as living proof of the importance and dire consequence of surprise in all initial phases of operations.

The application in each example varies depending on the characteristics of each case—particularly geographical characteristics. Those in Sedan differed from those on the Maginot Line. If the crossing of the Somme and the thrust at the Weygand Line can be called classic examples, one must remember that the element of surprise was resorted to in the crossing of the Rhine with the mass

employment of motor boats in the initial phase of the campaign. It was the first time that motor boats were used in military operations of this type. But as war progresses and spreads, and the strength of one of the adversaries increases, we see how armies are prone to be less zealous over their secret plans of operations—be they tactical or strategic. We cite as an example the Allied Air Force in World War II, which, during the first phases of the campaign in central Europe, maneuvered only at night. Later, missions were accomplished throughout the day. Why? Because overwhelming superiority had made the attainment of surprise not only useless, but even harmful. They did not retreat; instead they sought air battles in order to liquidate the remainder of the German Air Force. A culmination of this trend was the final attack on Europe with the invasion of northern France. For months it had been announced with so much fanfare that the only factor kept secret was the exact place of execution. In Hiroshima, the atom bomb did not decide the outcome of the war—it only tended to hasten its end.

More political than military, the Korean conflict has taught us nothing new in this respect. Any military use of the element of surprise, because of the very nature of the conflict, would have nothing but local effect unless it could be used advantageously, as a psychological factor in forcing a change in attitude of one of the great powers who is backing the war; for its solution is more within the scope of politics than within that of military strategy.

Conclusions

Similarly, more than 20 centuries later, the element of surprise—despite scientific progress and improvements in the technical field and largely because of this very progress and improvement—is imperative in the field of tactics as well as strategy and also in the over-all strategy

or the general plan, having its broadest action in the preparatory and the initial operational phases of war. For in time, the adversary will adopt the attacker's methods and art of waging war, improve his security measures, regain his equilibrium, and thus make the element of surprise more difficult.

Yet the effect and consequence of its application are necessarily different—the logical result of the integrated characteristics of modern warfare. The element of surprise which won for Napoleon the decisive Battle of Ulm and Jena would be of little value today.

The experience gained in two world wars—in which neither party considers himself defeated until all his resources have been totally exhausted—and the ideological influences, lead us to make the assertion that the character of a decisive battle is quite different today.

We have witnessed how surprise and speed were the reasons for the unprecedented German triumphs. Nevertheless, we can determine these successes as local in the same sense that one applies the word "local" to the conquest of Poland and France when referring to war that has extended throughout the world.

Germany was winning the war at the end of the "first quarter," with such consequences that it was difficult for those taken by surprise—the Soviet Union—to change their tactics.

In spite of this, it is not on the operational front, as we might deduce, that decisive battles were won or will be won in the future, but rather on the production front. Even though a decisive battle for "superiority of resources" never was nor ever will be *decisive* in the field of tactics or strategy, it is indispensable today and must be provided for during general campaign plans. Reserves, the principal arm of command for which Napoleon was famous, are represented today in the availability of numerical strength and in the national economy. That is to say, the standard of living and economical and industrial potential of the warring nations, who having guaranteed life to their people, should uphold and support the conflict for as long as necessary.

Victory will go to the one who will make use of this strategic reserve—numerical and economical strength—in order to deal the enemy a decisive blow during the "last quarter" of battle.

Camouflage of Middle East Airfields

Digitized by the MILITARY REVIEW from an article by Geoffrey Barkas and John Hutton in "The Royal Air Force Quarterly" (Great Britain) April 1953.

DURING 1941-42 it so happened that the Army was the only one of the three fighting services in the Middle East theater to possess an establishment of trained camouflage specialists engaged full time on the task of controlling the visibility—and recognizability—of military plants, works, and equipment. Because of this the Army was asked to aid the Royal Air Force (RAF) in concealing its installations from aerial attack by the enemy.

Until the early summer of 1941 the prospect of serious or sustained air attack on base installations in Egypt and neighboring regions appeared too remote to justify the diversion of scarce manpower and materials on large-scale schemes of protective camouflage in the rear areas. With the advent of Rommel and the first deep penetrations of the *Afrika Korps*, however, the situation was suddenly transformed. The threat of heavy air attacks

upon our bases—and, among them, the RAF airfields in the Delta, the Canal Zone, Palestine and, in due course, Syria—became real and concealment became an urgent operational requirement. Not unnaturally, in the circumstances, the RAF sought advice and help from the Army's camouflage organization. And not unnaturally, for reasons of enlightened self-interest, the Army did what it could and continued to do so until victory at El Alamein lifted the threat once and for all.

It is proper to stress at the outset that camouflage schemes which succeeded in 1941 and 1942 might fail completely if repeated today. The contest between the camouflage man and the enemy's visual intelligence service never stands still. It resembles the ceaseless competition between the safe-maker and the safe-breaker. New weapons, new and more penetrating techniques of observation, call continually for re-assessment of the practicability and the ways and means of imposing a false but plausible picture upon the enemy. It must be remembered that in those days, almost 12 years ago, our work was not exposed to attack by pilotless aircraft, guided missiles or atom bombs. We had, as yet, no need to worry unduly about the magic eye of infrared or of air-to-ground radar. It did not depress us unduly to know that our schemes could hardly hope to withstand the scrutiny of skilled interpreters of aerial photographs. We knew that even if a target had been correctly identified and accurately pinpointed from aerial photographs, a worth-while measure of protection could still be provided against the eye of the fallible human being in the enemy bomber—the man who had to pick out and be quite certain of his mark while still a considerable distance from it.

Our work on airfield protection began with a conference at which both sides sought common-sense answers to the simple questions which always have and al-

ways must lie at the root of every successful scheme of camouflage. What are we trying to hide or to display? What form of observation are we trying to deceive? At what range and from what viewpoint? How much manpower, material, transport, and money can justifiably be spent?

The answer to the first question was quickly forthcoming. There were two main kinds of airdrome for which the RAF required protection. First, the great permanent airports which had been taken over for war, and which had gathered around them a great clutter of buildings, long regular rows of huts, administrative blocks, enormous north-light hangars, and workshops and vast acreages of runway and apron—glaringly conspicuous from long distances no matter whether they stood in the bald desert, in the cultivation, or alongside the built-up fringes of town or city. Secondly, the purely wartime landing grounds consisting of two runways, usually X-shaped, and making an immense and eye-catching scar across the natural or man-made pattern of the landscape—particularly when, as often occurred, the landing ground cut boldly through the checkered pattern of farming land. There were, of course, associated disfigurements in both classes—perimeter taxi tracks and aircraft dispersal points, pens, and so on. But the major problems were the runways and aprons—and, above all, the huge hangars and workshops.

Up until now the RAF had regarded effective concealment of their airfields as a hopeless proposition, mainly because of the jet black shadows cast by hangars and other buildings. In fact, at the first meeting, the presiding air vice-marshal said frankly that he did not believe that the shadows could ever be either "killed" or adequately distorted or imitated, at an acceptable cost.

At first sight there was indeed every justification for such doubts on the layman's part. Viewed from the air—and es-

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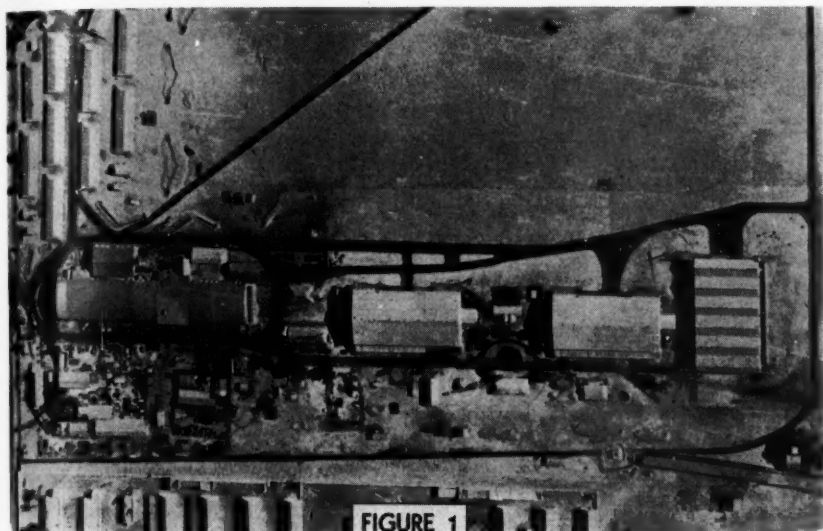


FIGURE 1

Figure 1 (above) shows an airfield with four large hangars built in a straight line which served as a "visual fix" from great distances. Figure 2 (below) shows the same airfield at about the half-way stage in its camouflage treatment. The hangars have been made to appear as a neat row of houses.—British Crown Copyright Reserved photos.

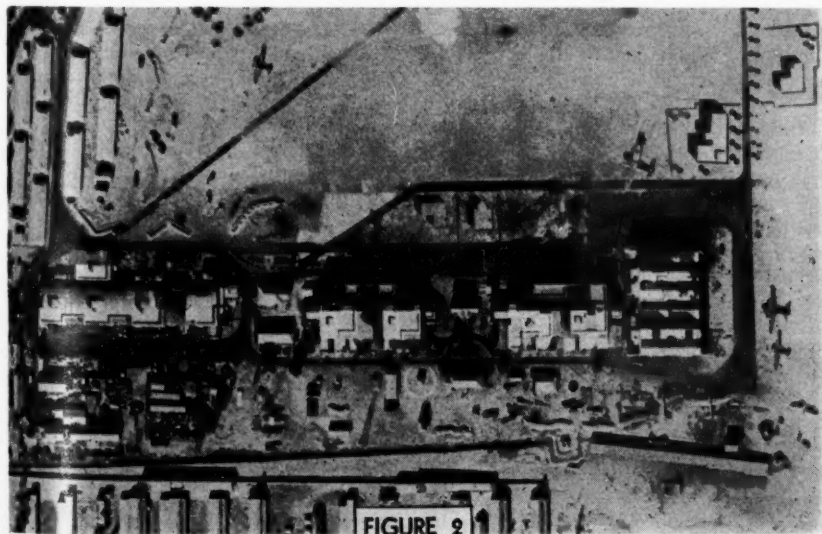


FIGURE 2

pecially in Middle East conditions, under a blazing sun shining down on such brilliantly reflecting surfaces as concrete, tarmac, or smooth sand—a natural shadow is the darkest object in any landscape. White paint applied on the shadow can do little or nothing to lighten it. The blackest paint applied to a smooth sunlit surface cannot approach the blackness of a real shadow, although some approximation to a shadow may be achieved by roughening the surface before painting, or by incorporating in the paint itself some grit or large enough grain to scatter the reflected sun or moonlight and provide what is called “contained shadow.” Nevertheless, camouflage experts had given the problem some thought and were confident that, in theory at least, an appreciable degree of confusion and a consequent shortening of the range of positive identification by an enemy bombardier was attainable.

Quite understandably, the air vice-marshal regarded the first tentative suggestions for camouflage treatment exactly as Mark Twain described the Book of Genesis. He found them “interesting but steep.” There were, as yet, in the Middle East no complete examples of toning-down or deceptive patterning from which he could judge the efficacy of the tricks we had in mind, or the cost of applying them to the roof and sides of even one hangar—to say nothing of whole runways, aprons, and the aggregations of buildings and significant features that made up a complete airfield. Very sensibly, he decided that a pilot scheme on a relatively small scale should be carried out immediately and more important decisions deferred until the result and the cost could be assessed.

The Pilot Scheme

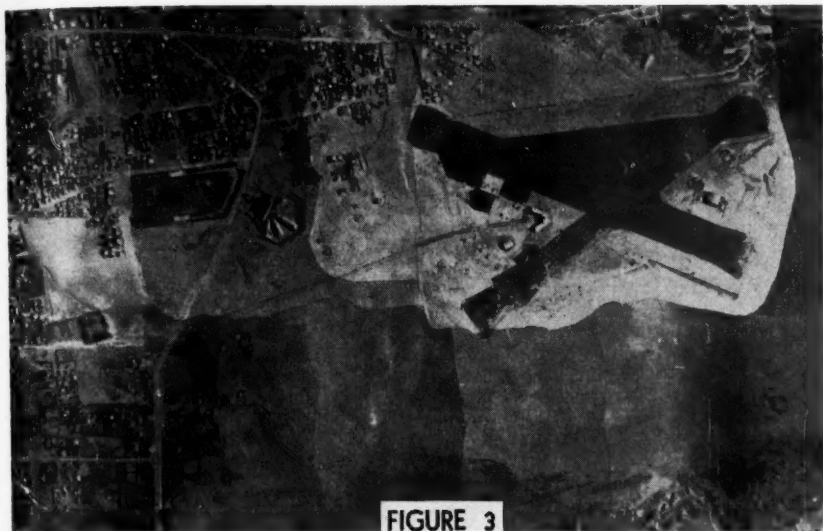
The subject of the first test was a large workshop hangar on a permanent airdrome in the Delta. The object of the exercise was to demonstrate what camouflage could

do to reduce the range at which an approaching bomber could positively identify the building, and thus convert an easy target into a difficult one by lessening the risk of accurate bombing on first run-in. Since the airport was closely adjoined by a residential area, here was an excellent chance to attempt the two-dimensional simulation of houses and their shadows by painting and “texturing” suitable shapes over the whole roof surface and thus “lose” the building in the general built-up pattern of the surroundings. And here, also, was a good opportunity of experimenting with methods of breaking-up or blanketing the jet black shadows of the hangar.

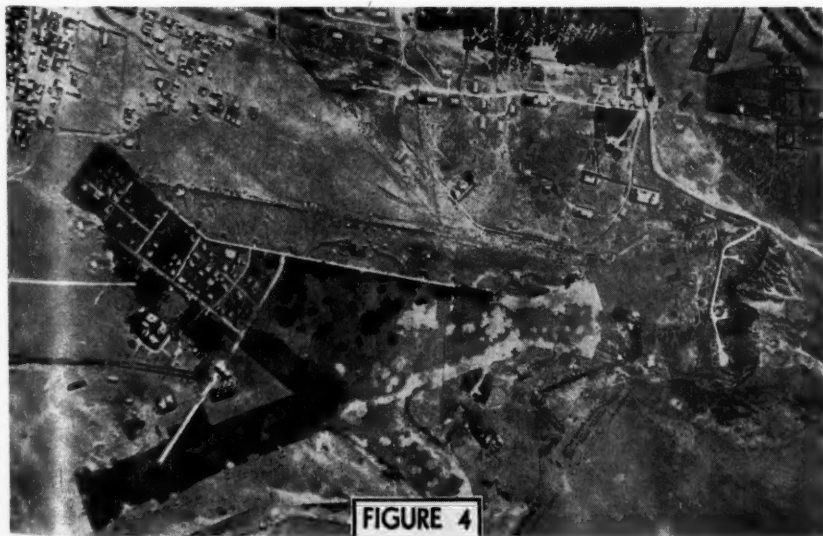
Many technical difficulties had to be met, which included the problem of simulating in two dimensions the shapes and shadows of houses on the differently inclined planes of a series of pitched roofs. The splitting-up of the main shadow of the building was effected by stretching opaque netting from eaves to ground, and the blending of the hangar with its residential surroundings was further helped by continuing the two-dimensional pattern of small “houses” on the ground alongside by means of clinker sprayed with tar to create the illusion of shadows, and stones washed with cement slurry to provide the sunlit “roofs” and “walls.”

Obviously, this false pattern of small houses could never have foxed the aerial photograph interpreter, for the alignment of the imitation shadows with the real ones in the neighborhood could have been plausible for only a few minutes every 24 hours. But, as previously stated, it was not the camera but only the eyes of the man in the bomber that the camouflage experts hoped to deceive.

As soon as the work was finished, the RAF assessed its value by flying toward it at various heights and angles of light, by day and night. It is sufficient to say that on the strength of this pilot scheme

**FIGURE 3**

The camouflage experts were called on to meet many situations in desert warfare. Figure 3 (above) shows an airfield near a native village before camouflage treatment. The runways after camouflage treatment, Figure 4 (below), have been blended partly into the village and partly into sand and scrub.—British Crown Copyright Reserved photos.

**FIGURE 4**

the authorities were convinced that the results justified the effort and resources involved, and issued instructions to proceed at once with more comprehensive schemes, including, if possible, the treatment of whole airfields.

Scheme for Airports

One of the first complete airports chosen for camouflage treatment was not far from Cairo, on the outskirts of a modern residential town. The ground was light-toned sand and on this reflecting area stood the usual vast pattern of buildings, runways, aprons and taxi tracks—mostly tarmac. Some slight success had previously been achieved by “blinding” the tarmac with sand, but the improvement was partial and temporary. Under stress of weather and use, the sand soon wore thin and the tarmac surfaces soon began again to show nakedly through.

It was, therefore, decided to adopt, on a grand scale, the scheme of blending the conspicuous and significant areas of the airport back into their surroundings by means of the two-dimensional “houses” which had proved successful in the pilot scheme, plus some additional tricks—for instance, the simulation of avenues of trees alongside the taxi tracks.

Figure 1 shows an important and difficult corner of the airport in question. In their original untreated condition the four very large hangars sited in a straight line acted as a “visual fix” from long distances, and the associated aprons and taxi tracks made this corner still easier to locate.

Figure 2 shows the same place at about the halfway stage of treatment. The improvement in the technique of patterning the roof surfaces is noticeable. The solidity of the “houses,” the density of the shadows, and the extent to which the size and character of the buildings have been destroyed is evident. The pattern on the hangars is being continued on the tarmac

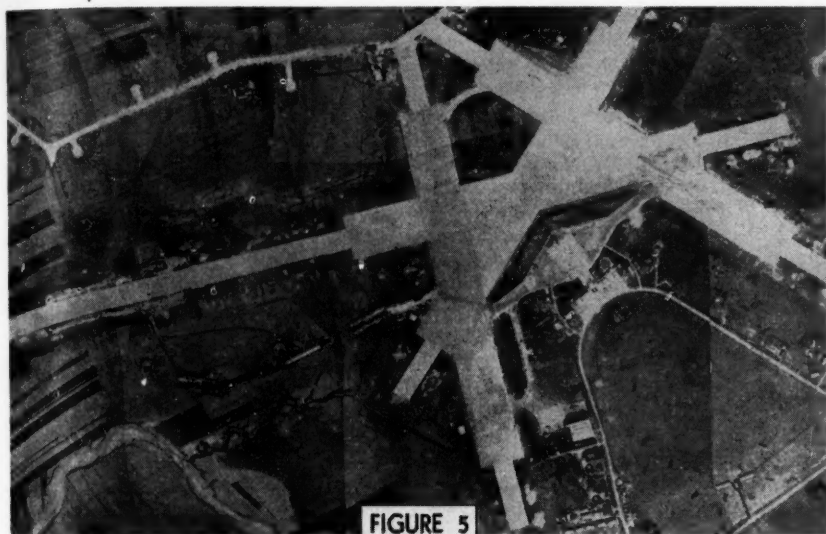
and some of the black taxi tracks close to the buildings have been “killed,” thus making the whole group less regular in appearance and much harder to pick out with certainty by an attacker. A start has also been made on creating the illusion of more buildings and rows of trees on the landing ground at the lower right hand corner of the row of hangars. It was not long before a tribute was paid to the success of the scheme. An aircraft carrying a party of high-ranking officers arrived over the airport, intending to land. It circled for some time and could be induced to touch down only after repeated assurances from the ground, because the pilot could not find any runway which did not appear to be hopelessly obstructed by buildings or trees.

Concealment Near Native Town

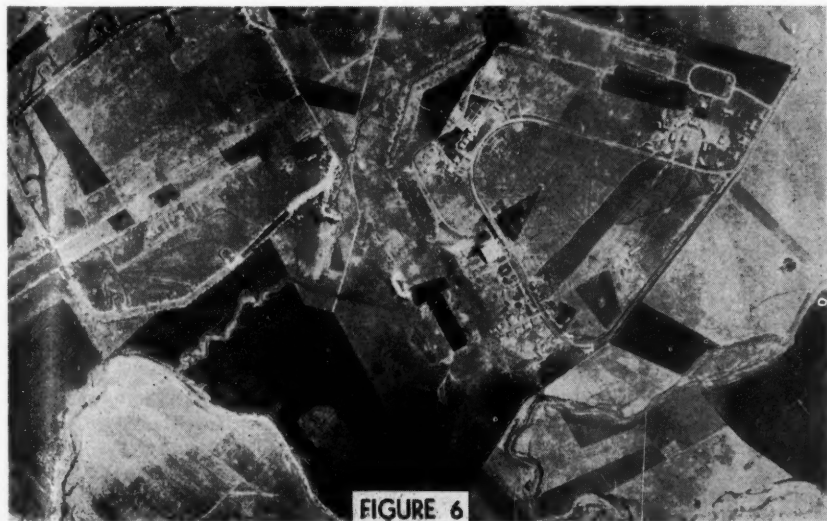
Figures 3 and 4 show the before and after of another airport on which the camouflage objective was to blend the runways partly into the pattern of a neighboring native quarter and partly into a background of sand and scrub. The airfield was not heavily encumbered by large buildings, but it did possess a conspicuous visual fix in the unusual “V”-shaped administrative building at the angle between the runways. Figure 4 was taken before completion, but there can be no doubt that the visibility of the whole installation has been greatly reduced at operating ranges. This airdrome was so well camouflaged that the RAF while warmly congratulating us on the efficiency of the treatment, begged us kindly to suspend further camouflage work since their own accident rate due to anxious landings was showing signs of exceeding their battle casualties.

Airfields in Farming Country

A number of wartime airfields in the Middle East had been constructed in country farmed by the Arabs. In such cases the runways cut immense and glaringly

**FIGURE 5**

Airfields that were constructed in areas that were farmed by the Arabs were most difficult to camouflage. Figure 5 (above) shows such an airfield serving as an obvious landmark for enemy bombers. The same airfield, Figure 6 (below), with camouflage not yet completed, is more difficult to locate.—British Crown Copyright Reserved photos.

**FIGURE 6**

conspicuous scars across the man-made pattern of browns and greens.

If concealment was important enough to justify the price, there was no alternative but, first, to induce the Arabs to continue farming all the spare ground up to and between the runways; second, to texture and paint the runways, aprons, and taxi tracks in tones, colors and patterns to match the real cultivation; and third, to do whatever was possible to treat any large buildings on or near the landing ground.

Figures 5 and 6 show a particularly successful example of the treatment of such an airdrome. The scheme is not complete and therefore not perfect. It will be seen that various tracks leading to dispersal points have not yet been fully dealt with. Nevertheless, the blatancy of this particular installation has been very greatly reduced.

Marble Chipping Runways

The last kind of airfield which we can usefully mention is the emergency landing ground type. There were many of these, hurriedly prepared to meet an expected tactical threat, consisting merely of two strips in the form of a broad "X" whose surfaces were composed of millions of chippings of locally quarried white marble each about the size of a pea. With the cussedness of the inanimate, most of these blindingly white landing grounds were sited in areas of red or deep brown soil, and stood out like chalked crosses on a blackboard.

At first nothing was scheduled to be done to these because there were so many of them and so little labor and materials available. However, one day there was a visit by members of the Air Staff from the United Kingdom who were horrified by the nakedness and staring appearance of these airfields, even at night, and a radio message came through that the white crosses had to be killed somehow or other, as a matter of high priority.

The somewhat harassed camouflage officer in charge of the areas concerned (he was already working in four different countries) sat down to figure out how it could be done. Each chipping has at least four sides, perhaps seven or eight, and unless all these were painted, every aircraft that landed, and every high wind, would tend to turn the chippings and expose the white sides. Dipping them in tanks of paint was not possible, because they were already on the runways. In addition, there was not enough paint or labor for the job.

There was, however, a large cement factory in one of the countries concerned and after some talks with officials, this was commandeered and converted to the production of red-brown cement paint. It was fascinating to see the great white buildings changing gradually to brown as they churned out the paint and became coated with the colored dust.

The RAF officer in charge of labor smiled cynically when asked to provide thousands of workmen to do the painting. "What you want are women and children." So women and children it had to be. The paint, contained in 40-gallon drums, was loaded on carts and spilled over the runways. Drove of mothers and their children followed closely with brooms, brushing and rolling the chippings over in the flood of paint, uttering queer cries, and the mothers were constantly rescuing their toddlers from total immersion under the gushing drums. This extraordinary scheme stopped suddenly for 2 hours in the middle of every day, to allow the women to go home and cook a meal for their men.

Techniques

All sorts of materials were used to produce the dense blacks needed to create imitation shadows. On tarmac a mixture of tar and coal-dust was usually found effective. On sand a much coarser or deeper "texture" was needed. Clinker, spread

with tar, was much employed; and on one occasion an admirable series of shadows was made by using a shipload of coffee beans which had been spoiled by seawater and blackened by fire.

The key to making successful two-dimensional "houses" on flat surfaces is to achieve the greatest possible exaggeration of the contrast between bright areas and shadowed areas. The contrast must usually be so great as to appear almost ludicrous at very low altitudes or to anyone traversing the pattern at ground level. It was the experience of most camouflage officers that their clients could only with difficulty be persuaded *not* to judge a scheme of concealment or display by standing in the middle of it.

Another mistaken attitude, frequently encountered, was a childlike faith that once the paint had gone on, the airfield was camouflaged forever, and that it provided a magic cloak which absolved the owners of the installation from any care in preserving the plausibility of the scheme. It had to be continually stressed that however successfully one might have disguised a hangar as a block of small private houses, the scheme would be compromised if 20 or 30 aircraft were parked in rows alongside. There was also, and probably always will be, much difficulty in persuading the authorities that painted schemes of camouflage require regular maintenance, particularly in regions like the Middle East where airborne dust can so quickly carpet the ground.

In addition to dealing with airfields, the Army Camouflage Organization co-operated with the RAF on many other problems of visual misinformation. Methods of hiding walled dispersal pens were developed and successfully used at a few important sites. Dummy airfields were made in several places, partly to deflect attack from real targets, and partly to confuse

the enemy's appreciation of our intentions or strength. But since landing strips without signs of operational activity could not be expected to deceive the enemy, this work brought in its train the design and production of great numbers of associated dummies, collapsible and transportable, to represent huts, slit trenches, antiaircraft defenses, dispersal points, and, most important, dummy aircraft to dress the scene. Much was done in the matter of decoy fires.

What of the Future

All the forms of camouflage described in this article were intended to provide answers to particular problems in the particular conditions of the Middle East campaign more than 10 years ago. Would our scheme succeed today or tomorrow? As we have already said, it is quite conceivable that if exactly repeated in another war our methods of concealment and of display would be easily unmasked. Do the new weapons, tactical conditions, and techniques of observation mean that camouflage, in its proper sense of visual misinformation, is played out? In the opinion of the writers, it most certainly does not. No matter where or how the next war may be fought, the enemy will depend, to some considerable extent, for his tactical information upon things seen and things photographed. Provided that the camouflage man and the scientist have continuously studied the new methods of observation and developed practical countermeasures, and provided that the planners and the troops are aware of what camouflage can do and what it demands, it will be possible to deny vital visual information and "sell" vital misinformation—at a price. It is hoped that the field forces in the next war are better prepared and equipped for the task than they were in 1939.

BOOKS OF INTEREST TO THE MILITARY READER

MODERN ASIA EXPLAINED. By W. R. McAuliffe. 163 Pages. Philosophical Library, Inc., New York. \$3.25.

By LT COL JOHN M. KINZER, *Army*

The author presents in this book an easily readable and understandable summary of the important historical, social, economic, religious, and political developments which have produced modern Asia. Each of the present Asiatic states is treated separately, except those states which are members of the Soviet Union.

Included in the book are Egypt and the Sudan, even though they are not Asiatic states from a geographic standpoint. The author feels that the affinities of these states, particularly Egypt, are more with the Near East than with continental Africa because of Egypt's membership in the Arab League, and the close ties between Egypt and the Sudan.

About one-third of the book is devoted to the successor states of the Indian Empire. The roots of many of the most pressing problems in these states are bared.

The military reader will find in this book some very valuable background material for a more complete understanding of current events in an area which is becoming of much more critical importance to both Western and Eastern international relations.

In addition, the nature of the problems which remain to be solved by Asiatic states is pointed out by the author in such a manner as to leave no doubt as to the significance on world affairs of the solutions to be worked out.

MINERALS—A KEY TO SOVIET POWER. By Demitri B. Shimkin. 452 Pages. Harvard University Press, Cambridge, Mass. \$8.00.

By LT COL CHARLES E. WELSH, *Army*

The availability of minerals limits and influences the course of modern international power politics. As the first step in determining this influence, Dr. Shimkin has produced a systematic survey of the mineral resources, as well as the production and consumption position of the Soviet Union.

Dr. Shimkin draws few conclusions from this study that are significant to the average military reader. The chronic shortage of bauxite and consequent low production level of aluminum in the Soviet Union has an obvious effect on the country's economy and military production. However, shortages of such minerals as titanium, tungsten, and borax require technical analysis before usable conclusions can be reached.

It is the apparent intent of this book to establish a basis for further study of the ultimate effects of the Soviet mineral position. As a well-documented collection of mineral data, it does just that.

THE UNITED STATES AND THE FAR EAST. By Harold M. Vinacke. 144 Pages. Stanford University Press, Stanford, California. \$3.00.

PLOUGHSHARES INTO SWORDS: Josiah Gorgas and Confederate Ordnance. By Frank E. Vandiver. 349 Pages. University of Texas Press, Austin. \$5.00.

STRATEGY FOR SURVIVAL. By John E. Kieffer. 306 Pages. David McKay Co., Inc., New York. \$4.00.

By MAJ DANIEL J. KERN, *USAR*

Comparison of *Strategy for Survival* with the also recently published *Wings for Peace* by General Bonner Fellers is a natural probability. Insofar as each is concerned with the present Soviet threat to the security of the United States, the two books are alike. Beyond that, it can be safely said that they are as far apart as the poles.

Wings for Peace proposes the establishment of a strategic air force of the greatest possible strength, the reduction of the United States ground forces to 10 divisions, and a proportionate decrease in aid to our allies. General Fellers believes the deterrent of an air arm capable of destroying the Soviet's means of war production may even win a secure peace without conflict. Lieutenant Colonel John E. Kieffer, World War II infantry battalion commander, political scientist, and geopolitician, on duty with the Air Force since March 1951, believes that armed conflict with the Soviet Union is inevitable—indeed, that certain phases of the third world war have already been initiated by the Soviet Union. On this premise, with which at this date there should no longer be any quarrel, *Strategy for Survival* builds the structure for the defense of the West and the ultimate defeat of the common enemy.

The structure is sound. It considers and plans for the use of all arms—ground, navy, and air—as it necessarily must. It recognizes the concerted character of the apparently independent aggressive actions in Southeast Asia; it recognizes the threat thereof to Japan and India; it recognizes the major threat in Iran and the Middle East; it measures the capability of the Soviet Air Force, as presently constituted, for attack on the United States;

it establishes in their proper relationships the use of the "glamour" weapons—the A-bomb, the non-existent "ultimate weapon," and psychological warfare. The structure is erected on a well-oriented, comprehensive, and sensible analysis. The courses of action it suggests, if they do not gain the approval of every professional strategist, will at least provide all with much substance for reflection.

Rear Admiral H. P. Smith, Director of the Office of Foreign Affairs, Department of Defense, says, "I recommend this book for study consideration at the various service schools and military colleges." In the opinion of this reviewer, *Strategy for Survival* is a must for the military reader. Colonel Kieffer writes with conviction and authority; in addition, his style is easy and fluent, and at times colloquial. Even the casual layman thus need not hesitate to digest and ponder this book.

ARABIA REBORN. By George Kheirallah. 307 Pages. The University of New Mexico Press, Albuquerque. \$4.50.

By LT COL FRANCIS R. SULLIVAN, *CE*

This book is a survey of present-day Arabia. In it the author relates its ancient to current history and, more particularly, details the events in the rise of King Abdul Aziz Ibn Saud. As a matter of fact, his narrative is more detailed and repetitious than most reader interest will tolerate. The perfection and infinite wisdom attributed to Ibn Saud induce a certain amount of reader skepticism, to say the least. Certainly, the reader will not find this book subversive to the interests of Ibn Saud, of the Arabian-American Oil Company, or of the relations between the two!

Nevertheless, the book does much to portray modern Arabia and the important influence of oil and Ibn Saud upon it. Some readers, however, may not accept the author's view that Ibn Saud is the more important of the two!

YOUR WAR FOR PEACE. By Brigadier General Frank L. Howley. 166 Pages. Henry Holt and Company, New York. \$2.75.

By COL MARSHALL W. FRAME, *Armor*

Foreign policy is your problem. You can blame individuals for its shortcomings. You can curse a party. You can talk yourself into collective irresponsibility but your individual responsibility remains.

Republican as well as Democratic Presidents, Senators, Congressmen, and Secretaries read the morning papers, look at television, listen to the radio, and ask local politicians what you think. If you don't think, you had better start—because you pay the bills, you die on the battlefields, and you are responsible for your government and its policies.

With this blunt statement, which challenges the reader to develop an interest in United States foreign policy if he does not have such an interest when he opens *Your War for Peace*, General Howley proceeds to present current international problems and their background development.

In a direct manner, not always flattering to the United States, the author outlines the foreign policy of the United States as he has seen it at the implementation level as Director of Civil Affairs and Military Government in Paris and later for 4½ years in Berlin. He characterizes the United States policy as having three primary ingredients: the policy of appeasement; the policy of co-existence; and the policy of containment. General Howley then explains the application of these policies to problems in Korea, Iran, Yugoslavia, India, and France.

In chapter two, "What is Germany Really Like," General Howley is at his best. He gives a graphic description of German reaction to allied occupation; the postwar economic and industrial development; the changes in German habits and thinking; the German educational system and, of course, the political thinking of

Germans, in both East and West zones.

He includes thumbnail sketches of such political leaders as Adenauer and the late Kurt Schumacher which add to the general understanding of the German's private and official views on such problems as the Schuman plan; German participation in a European Army; and the ever present, overriding desire for national unity. To broaden the European political picture there is a thorough discussion of Soviet aims, and methods of attaining those aims, and an analysis of French government structure, internal political and economic instability, and the external problems facing France.

Throughout the book there is an uninhibited evaluation of the results of United States policies upon our allies and our potential enemies.

One chapter is devoted to answering some of the most frequently propounded questions on European attitudes and reactions. This should be of interest to readers who have asked these same questions or heard them asked many times.

Chapter five is a military and political estimate of the situation in which the author analyzes in a military manner the mission of the United States, the capabilities of the enemy, the courses of action open to the United States, and after a discussion—offers not a decision as such, but certain precepts which the author strongly feels must be elements of any decision reached.

General Howley has accomplished his stated mission; to present current problems, not to offer solutions to them, and to provide the reader with the background and the data with which he, the reader, can more intelligently select the courses of action which he believes to be best for future peace and prosperity of the world.

NEWS FROM SOUTH AMERICA. By George S. Fraser. 224 Pages. Library Publishers, Inc., New York. \$3.00.

VANGUARD OF NAZISM. By Robert G. L. Waite. 344 Pages. Harvard University Press, Cambridge, Mass. \$6.00.

By LT COL JOHN E. OLSON, *Inf*

In *Vanguard of Nazism* Mr. Waite presents a widely researched history of the Free Corps movement that arose in Germany during the years immediately following the Armistice of 1918. While many works have been published dealing with the rise of Hitler, few accounts, other than those of German origin, have covered the activities of the thousands of ex-soldiers who kept alive the spirit of resentment against the Treaty of Versailles.

Banding together in military or paramilitary organizations, these men dreamed of the day when a new leader would arise to restore Germany to her previous greatness. Filled by fanatically nationalistic men with a lust for action, the Free Corps organizations alternately fought the effete Weimar Government that was striving to create a democratic Germany, and the Communists who wished to overthrow that Government.

These disgruntled veterans and the many youths whom they recruited in their campaign of hate and revenge sooner or later fell under the spell of Hitler and furnished him a blindly devoted reserve for the vast armies he needed to carry out his plan to make Germany supreme. So unquestioning was this allegiance that there was no protest when, in 1934, Hitler, in a bloody purge, eliminated many of the former Free Corps leaders and bound their erstwhile followers firmly to the support of his scheme of conquest.

While Mr. Waite makes little attempt to draw an analogy between the rise of the Free Corps and the possible emergence of similar groups from post-World War II Germany, the reader cannot but be struck by the similarity between the Free Corps organizations and some of those reported to exist in Germany today, particularly within Eastern Germany.

Mr. Waite has a clear, readable style of writing. While he takes great pains to credit the sources of all data presented, he draws his own conclusions as to the reliability of these sources and the information gained from them. For the reader who desires to familiarize himself with the activities of the men who unknowingly paved the way for the rise of Hitler, *Vanguard of Nazism* is recommended.

REPORT ON THE AMERICAN COMMUNIST. By Morris L. Ernst and David Loth. 240 Pages. Henry Holt and Co., New York. \$3.00.

By COL FRANK J. CAUFIELD, *Inf*

Based upon a detailed study of more than 300 case histories of disenchanted Communists, the authors arrive at conclusions as to the motivations, backgrounds, and beliefs that impel individuals to join the Party.

The authors stress the point that to defeat the aims of communism we must first know them well; to wean the rank and file from the Party we must understand their reasons for voluntarily setting themselves apart from their fellow citizens.

The picture that emerges of the average American Communist is that of a frustrated psychopath who finds solace for his physical and personality failings in complete dedication to and acceptance by the Party. More often than not, however, these socially maladjusted people are well above the average with respect to intelligence and personal ambition.

The report claims that many American Communists would gladly recant if the way were made easy for them and it is highly critical of any approach which tends to drive the Party underground.

The reader should keep in mind that this study is based upon interviews with rehabilitated Communists only, therefore, its conclusions will not necessarily be applicable to the "hard core" which represents the real danger to national security.

UNITED STATES FOREIGN POLICY: Its Organization and Control. By William Y. Elliott. 288 Pages. Columbia University Press, New York. \$3.75.

By MAJ ROGER E. LAWLESS, *SigC*

In this book, a formidable study group of six men under the aegis of the Woodrow Wilson Foundation have set down their conclusions as to the process by which our foreign policy is formed and controlled. Writing as members of an independent research committee, these authors (whose day-to-day occupations are the practice and study of United States foreign policy) have come up with a guide for the public and the Government in this vital sphere of our national and international existence.

It is certainly worth noting the author-personnel included in this strong group of qualified minds: William Y. Elliott, McGeorge Bundy, and Arthur M. Schlesinger, Jr., all of the Harvard faculty; George F. Kenna, of the State Department; Don K. Price, of Hoover Commission fame; and Harry D. Gideonse, President of Brooklyn College. The issues they recommend for further development represent a unique consensus of provocative themes, including a series of searching queries on the role of the military in foreign policy.

No isolationists, these men say flatly that the life of our nation today depends on our foreign policy. Despite its strength, the study group opines that the weaknesses of this policy heretofore (internal irresponsibility and dissension) may be fatal unless corrected forthwith. The tendency of the American public to gloss over the realities of power politics has, they feel, engendered a national leaning toward escapism, and the delusion that peace can be "moralized" into being.

The authors study various forces that act on our foreign policy and discuss the effects of the constitutional separation of powers on the roles of the three govern-

mental branches, the operation of (political) party responsibility, and the play of "interest groups." Public opinion is evaluated as are "The Three P's" (power, principle, and policy) in the operation of foreign affairs.

In their conclusion, these savants become extremely realistic and make hard-headed, specific suggestions for reform in the American constitutional, political, and administrative set-up. They also state their general conclusions and make recommendations for further study. With the ever increasing correlation of military and political programs, this volume is recommended to today's soldier, for he may well be tomorrow's diplomat.

AMERICAN FIREARMS MAKERS. By A. Merwyn Carey. 145 Pages. Thomas Y. Crowell Company, New York. \$5.00.

By LT COL THOMAS O. BLAKENEY, *Armor*

Although this encyclopedia of American firearms makers will be of passing interest to most military readers, it is a reference book which will be of infinite value to the firearms collector.

More than 21,000 alphabetical entries make this the most complete reference work of its type in print. It affords, in one readable volume, accurate data which an individual would have to research from countless books if *American Firearms Makers* were not in print. The data is concise, accurate, and contains such appropriate information as to the maker's name, location, type of weapons made, patent date, descriptive markings, calibers, and dimensions of the arms. The book is illustrated with authentic, contemporary pictures. Undoubtedly a reference book of this type has been long awaited by collectors, antique dealers, libraries, and museums.

ETHICS IN GOVERNMENT. By Paul H. Douglas. 114 Pages. Harvard University Press, Cambridge, Mass. \$2.25.

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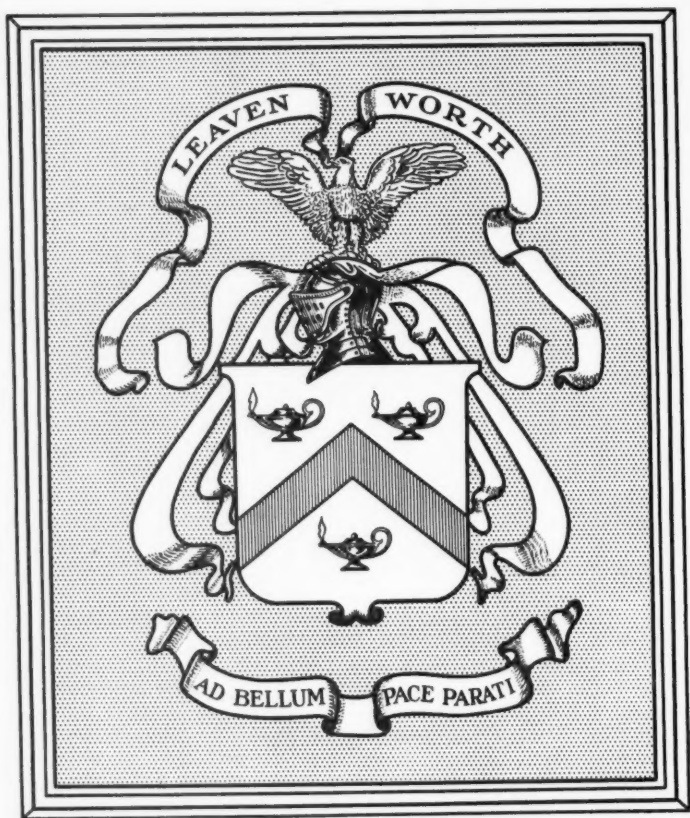
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